ORDER NO.KM69202418C1
G5

Service Manual

Printer

KX-P2123

)ot Matrix Printer

SD

Panasonic

Panasonic Communications &
Systems Company
Division of Matsushita Electric
Corporation of America
Two Panasonic Way
Secaucus, N.J. 07094

Panasonic Sales Company,
Division of Matsushita Electric
of Puerto Rico, Inc.
San Gabriel Industrial Park
65th Infantry Ave. Km.9.5
Carolina, Puerto Rico 00630

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1. Specifications

Power requirements: AC 120V/60Hz

Current: Idle: 0.2A ; Maximum 1.5A

Print mode: Draft, Letter Quality (Courier, Prestige, Bold PS, Script, Sans Serif, Roman), Super Letter Quality (Roman)

Character sets: 96 ASCII characters, 33 International Characters (14 countries) + Legal, 158 IBM special characters sets 1&2, 38 Multilingual characters

Dot Diameter: 1/127 inch (0.2mm)

Dot configuration:

		Draft (PICA)	LQ	SLQ
Dot Alignment (H x V)		9 x 24	30 x 24	30 x 48
Dot Pitch	(H)	1/120"	1/360"	1/360"
	(V)	1/180"	1/180"	1/360"

Character per line (cpl)
(per inch (25.4 mm) (cpi)):

	Draft, NLQ	Elongated
Pica	80 cpl (10cpi)	40 cpl (5cpi)
Elite	96 cpl (12cpi)	48 cpl (6cpi)
Micron	120 cpl (15cpi)	60 cpl (7.5cpi)
Compressed	137 cpl (17cpi)	68 cpl (8.5cpi)
Elite compressed	160 cpl (20cpi)	80 cpl (10cpi)

Print speed:

	Micron	Elite (12 cpi)	Pica (10 cpi)
Draft	240 cps	192 cps	160 cps
LQ	80 cps	64 cps	53 cps
SLQ	———	32 cps	26 cps

Print direction: Bi-directional Character
Uni-directional Graphics & Color Printing

New line time: Approx. 100 msec [with 1/6 inch (4.2 mm) line feeding]

Paper feed: Friction and Push/Pull Tractor

Paper used:

	Width	Weight	Height
Fanfold paper	4-10 in (102-254mm)	16-22lbs (When Push) 16-24lbs (When Pull)	....
Single sheet	4-11.7 in (102-297mm)	14-24 lbs.	5-14.3 in (127-363mm)
Envelopes	Standard business envelopes ie: #6, #10 size		

Paper thickness: Total thickness of sheets must be less than 0.013 inch (0.32 mm).

Number of copies: Push: Original + 2 non-carbon copies
Pull: Original + 3 non-carbon copies

Storage environment
Temperature: -4°F to 140°F (-20℃ to + 60℃)
Humidity: 10-90% RH

Operating environment: 50°F to 95°F (+10℃ to + 35℃)
30-80% RH

Head service life: Black ribbon: 200 million strokes
Color ribbon: 100 million strokes

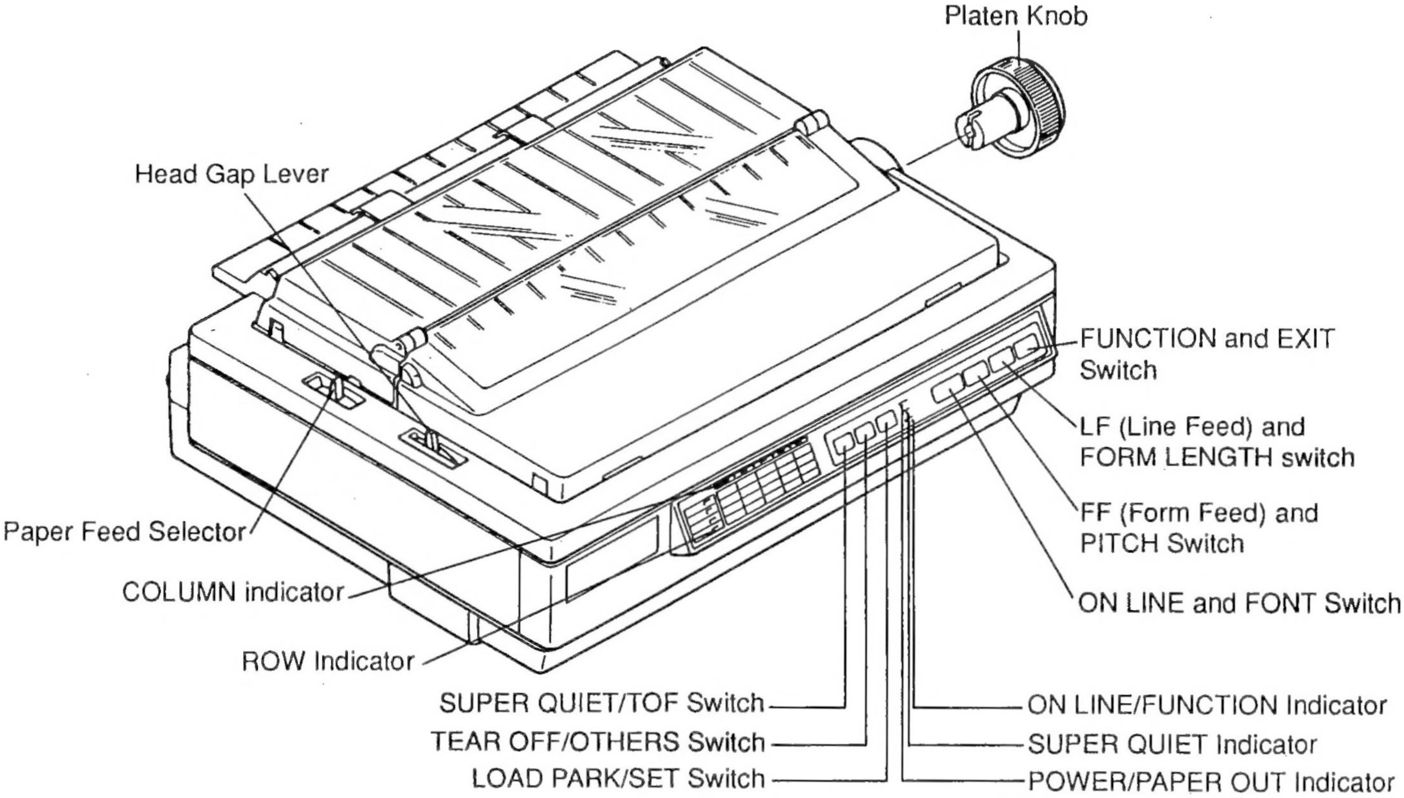
Ribbon: Cassette seamless fabric ribbon
Black ribbon cassette KX-P150: Service life: Approx. 4 million (Draft Mode)
Color ribbon cassette KX-P150C (option): Black: Approx. 0.7 million
Red (Magenta)/Blue(Cyan): Approx. 0.7 million
Yellow: Approx.0.4 million (Draft Mode)

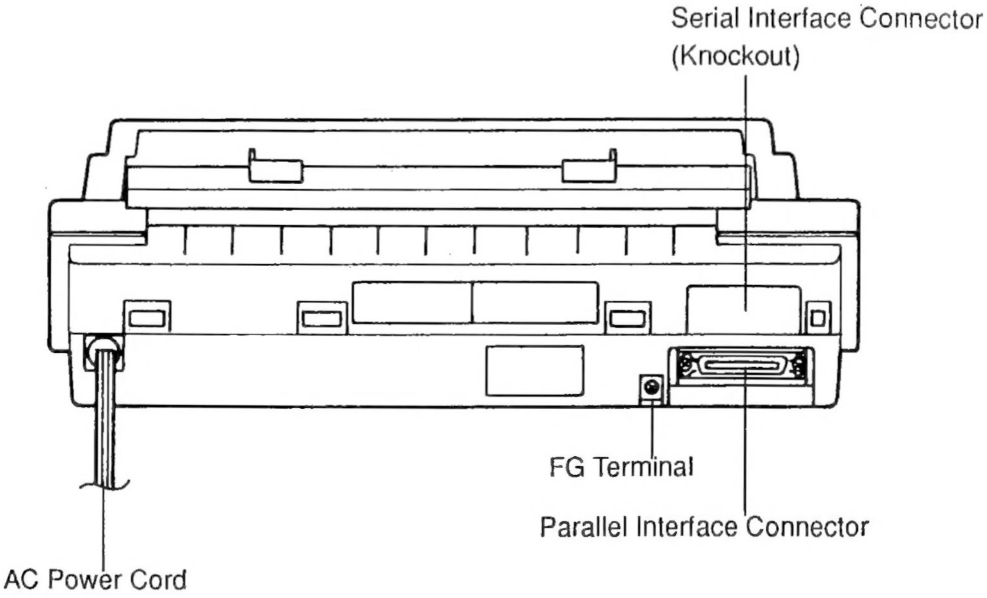
Dimensions: 18.1 (W) x 14.3 (D) x 5.8 (H) in. (459 x 365 x 149 mm)

Weight: Approx. 19.0 lbs. (8.6 kg)

*Specifications are subject to change without notice.

2. Operator Controls/Indicators

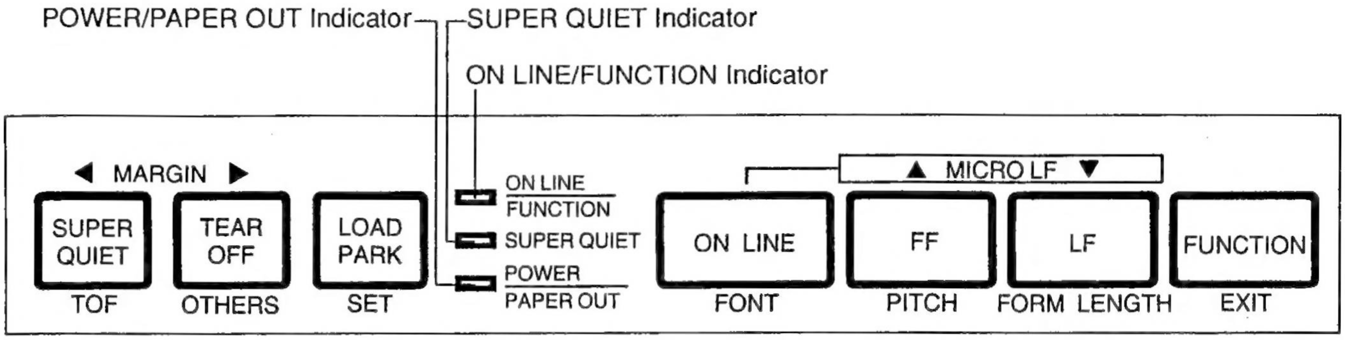

Platen Knob
Head Gap Lever
FUNCTION and EXIT Switch
LF (Line Feed) and FORM LENGTH switch
FF (Form Feed) and PITCH Switch
ON LINE and FONT Switch
Paper Feed Selector
COLUMN indicator
ROW Indicator
SUPER QUIET/TOF Switch
TEAR OFF/OTHERS Switch
LOAD PARK/SET Switch
ON LINE/FUNCTION Indicator
SUPER QUIET Indicator
POWER/PAPER OUT Indicator


Serial Interface Connector (Knockout)
FG Terminal
Parallel Interface Connector
AC Power Cord

3. Setting of Controls

This section covers the basic operation of the printer. For more detailed operation, refer to the operator's manual.

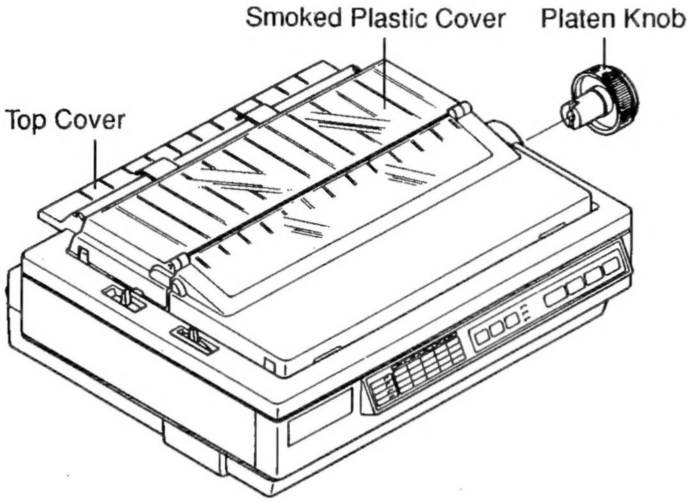
3.1 Print Mode

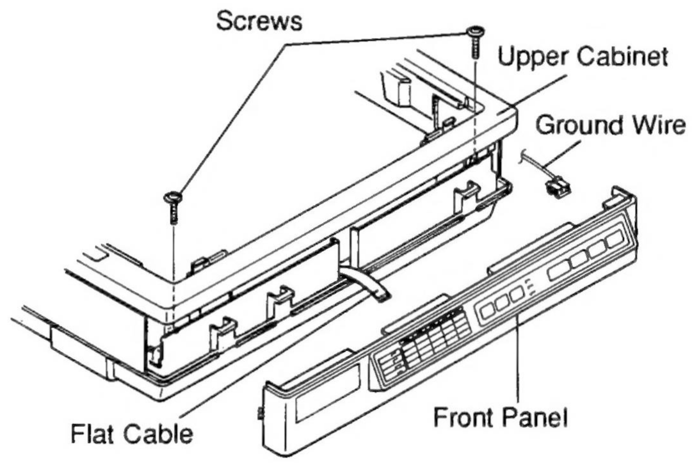


FUNCTION switch (EXIT) :	This switch is used to enter and exit the FUNCTION mode. In the FUNCTION mode, you can operate the Control Table, and Set the Top of Form. When FUNCTION mode is active, the ON LINE indicator will be blinking.
ON LINE (FONT) switch:	This switch opens and closes the communication lines with the computer. When the power switch is turned on, the ON LINE indicator is lit, and the printer is ready to receive data from the computer. In the OFF LINE mode, the indicator is out, and the printer can no longer receive data. In the FUNCTION mode, pressing this switch advances the column position for the Font on the Control Table.
FF (PITCH) switch:	In the OFF LINE mode or when the printer is not printing in the ON LINE mode, pressing this switch moves the printhead to the center and advances the paper to the top of the next page. In the Function mode, pressing this switch advances the column position for the PITCH on the Control Table.
LF (FORM LENGTH) switch:	In the OFF LINE mode or when the printer is not printing in the ON LINE mode, pressing this switch advances the paper one line at a time. Holding this switch will advance the paper continuously until the switch is released. In the FUNCTION mode, pressing this switch advances the column for the FORM LENGTH on the Control Table.
SUPER QUIET (TOF) switch:	In the OFF LINE mode or when the printer is not printing in the ON LINE mode, pressing this switch alternately turns the SUPER QUIET mode on/off. In the FUNCTION mode, pressing this switch sets the Top of Form (TOF).
TEAR OFF (OTHERS) switch:	In the FUNCTION mode or when the printer is not printing in the ON LINE mode, pressing this switch will advance or reverse the paper for perforation cut. In the FUNCTION mode, pressing this switch will advance the column position for the OTHERS on the Control Table.
LOAD/PARK (SET) switch:	In the OFF LINE mode or when the printer is not printing in the ON LINE mode, pressing this switch will load/park the paper. In the FUNCTION mode, pressing this switch will set or release the items on the Control Table.

4. Removal and Replacement Procedures

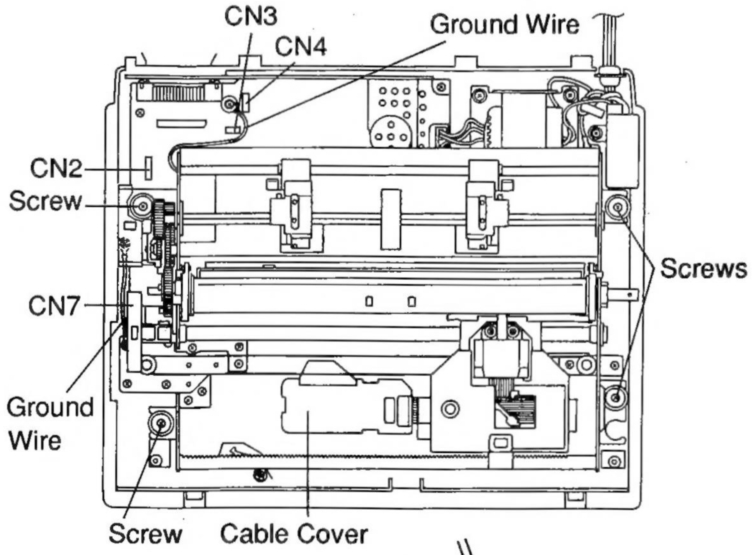
For safety and to avoid possible damage to electronic components, the AC line cord must be unplugged before disassembly.

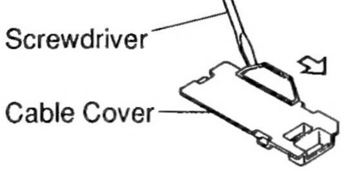

Smoked Plastic Cover
Platen Knob
Top Cover


Screws
Upper Cabinet
Ground Wire
Flat Cable
Front Panel

4.1 Covers

1. Remove the smoked plastic cover and the top cover.
2. Remove the platen knob.
3. Remove the screws (2) from the upper cabinet.
4. Remove the upper cabinet.
5. Unplug the flat cable from the front panel.
6. Unplug the ground wire from the front panel.
7. Remove the front panel by releasing 3 hooks from the bottom cabinet.


CN3
CN4
Ground Wire
CN2
Screw
CN7
Ground Wire
Screws
Screw
Cable Cover

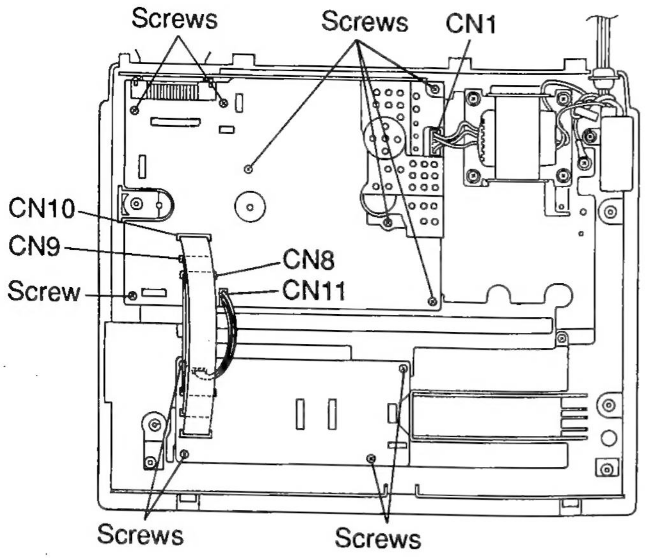

Screwdriver
Cable Cover

4.2 Printing Mechanism

1. Unplug connectors (CN2, CN3, CN4, CN7).
2. Position the carriage on the right side and remove the cable cover. Unplug the print head flat cables from connectors. If the optional color kit is installed, remove the color kit flat cable.

Note: To remove the Cable Cover gently lift the edge of the cover with a screwdriver and slide the Cable Cover to the right. Be careful not to damage the printhead cable.

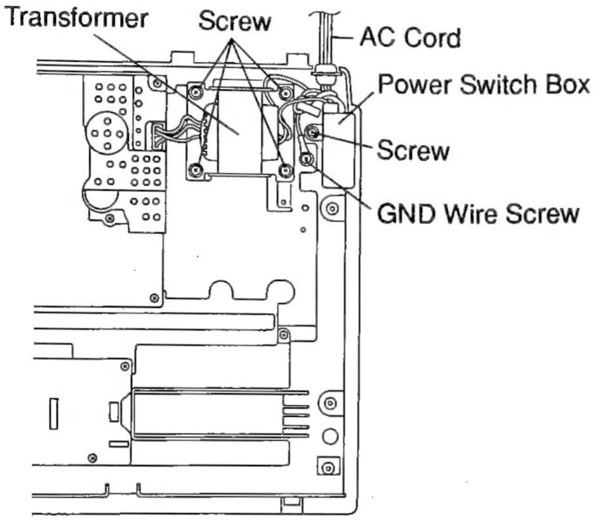
3. Loosen the carrier motor screw and remove the green ground wire.
4. Remove the ground wire that runs from the chassis to the logic board by removing the screw on the logic board.
5. Remove the screws (4) from the chassis.
6. Lift off the printing mechanism.


Screws
Screws
CN1
CN10
CN9
Screw
CN8
CN11
Screws
Screws

4.3 Main Board and Relay Board

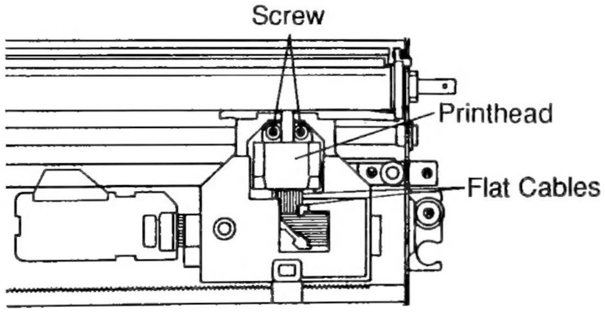
1. Unplug connector (CN1) on Main Board.
2. Remove 3 flat cables and 1 cable from CN8, CN9, CN10 and CN11 on the Main Board.
3. Remove the screws (7) from the Main Board. The Main Board can now be removed.
4. Remove the screws (4) from the relay board. The sub board can now be removed.

Note: When inserting flat cables, make sure that all cable connectors are fully seated in their respective sockets.


Transformer
Screw
AC Cord
Power Switch Box
Screw
GND Wire Screw

4.4 Power Transformer and Power Supply

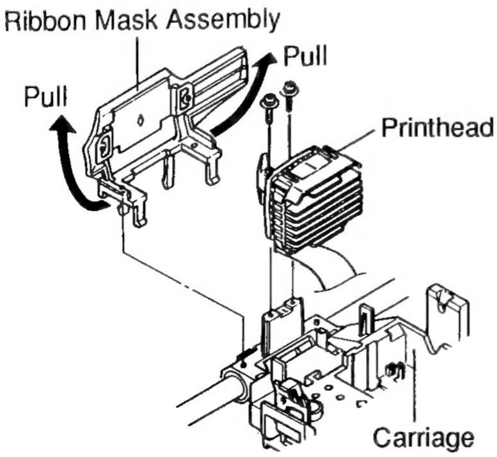
1. Remove the screws (4) from the power transformer.
2. Remove the screw from power switch box and remove the GND wire screw.
3. Lift off the AC cord clamp and remove power switch box from the bottom cabinet.


Screw
Printhead
Flat Cables

4.5 Printhead

1. Remove the screws (2) from the printhead.
2. Carefully raise the printhead and unplug the flat cables from the printhead. The printhead can now be removed.

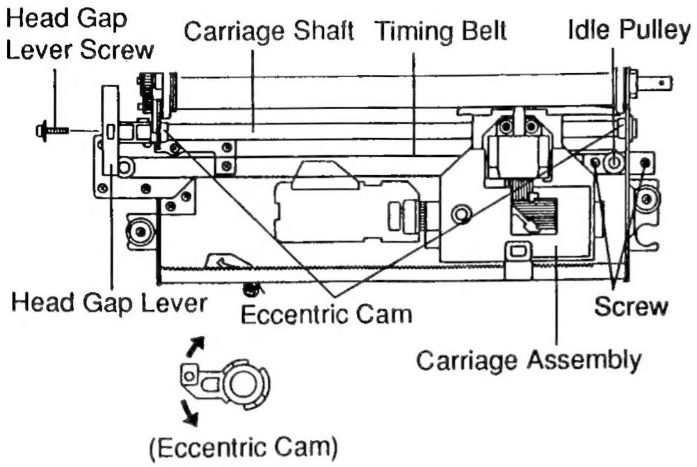
Note: When the printhead is installed, ensure that the head gap is correct.
Refer to section 5.1.


Ribbon Mask Assembly
Pull
Pull
Printhead
Carriage

4.6 Ribbon Mask Assembly

1. Remove the Printhead from the Carriage.
2. Carefully remove the Ribbon Mask Assembly by pulling up on the Tabs.

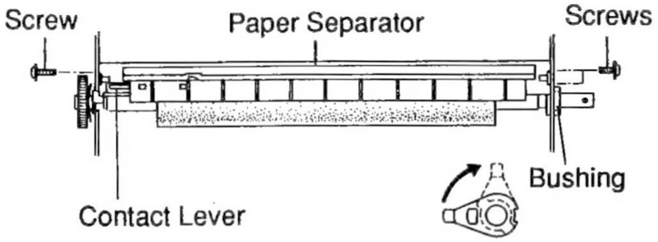
4.7 Carriage Assembly


Head Gap Lever Screw
Carriage Shaft
Timing Belt
Idle Pulley
Head Gap Lever
Eccentric Cam
Screw
Carriage Assembly
(Eccentric Cam)

1. Loosen the idle pulley bracket screws (2) and release the timing belt from the pulley.
2. Remove the head gap lever screw, and then remove head gap lever and plate.
3. Remove the carriage shaft eccentric cam from the right side frame by turning either clockwise or counter clockwise.
4. Slide the carriage shaft out from the right side and remove the carriage assembly.

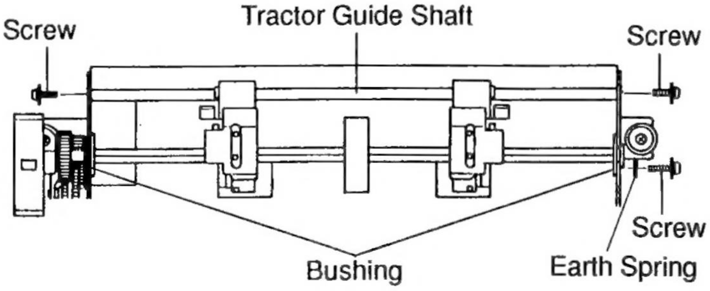
Note: When installing the carriage assembly and its shaft, ensure that the head gap is correct. Refer to section 5.1.

4.8 Platen Assembly


Screw
Paper Separator
Screws
Bushing
Contact Lever

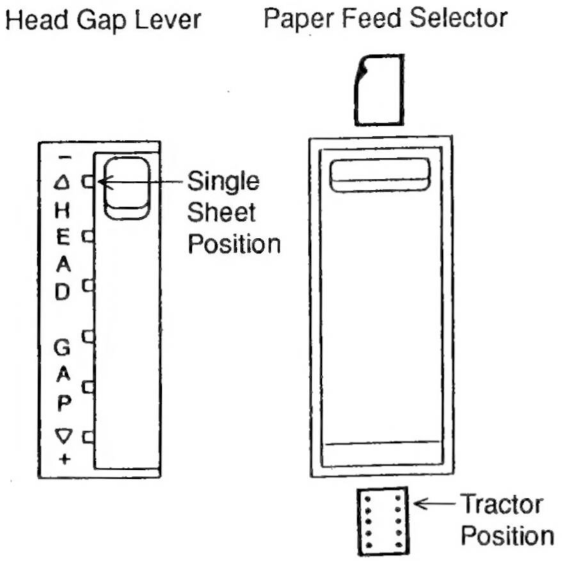
1. Remove the ejection roller assembly.
2. Remove the screws (3) from both sides of chassis frame. And then, remove the paper separator with the paper end sensor contact lever.
3. Release the right platen bushing from the right side frame by turning it.
4. Carefully slide the platen assembly to left side and remove the platen assembly from the chassis unit.

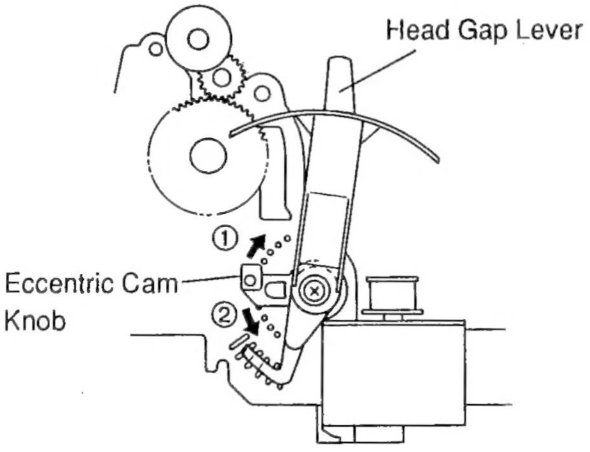
4.9 Tractor Assembly

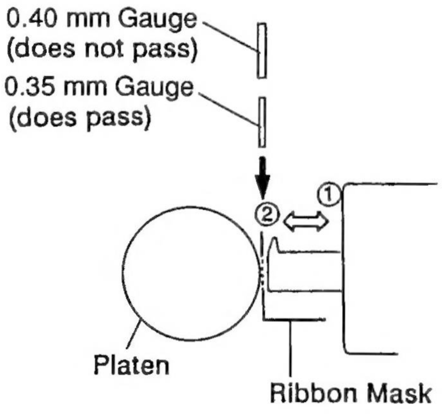

Screw
Tractor Guide Shaft
Screw
Screw
Bushing
Earth Spring

1. Remove the screws (2) from the tractor guide shaft.
2. Remove the screw (1) from the earth SP.
3. Unlatch the hooks of the bushing and release the bushing from the Chassis Frame.
4. Lift off the tractor assembly.

5. Adjustment


Head Gap Lever
Paper Feed Selector
- HEAD GAP +
Single Sheet Position
Tractor Position


Head Gap Lever
①
②
Eccentric Cam Knob


0.40 mm Gauge (does not pass)
0.35 mm Gauge (does pass)
①
②
Platen
Ribbon Mask

5.1 Head Gap

1. Set the head gap lever to the single sheet position.
2. Set the paper feed selector to the "⁞⁞" position.
3. Ensure the printhead is firmly secured with 2 screws.
4. Move the carriage to the print start position on the platen, and adjust the head gap between the platen and the printhead for a clearance of 0.35mm-0.40mm by turning the left eccentric cam.
5. Move the carriage to the print end position on the platen, and adjust the gap as per step 4 above by turning the right eccentric cam.

Note: The projection on the eccentric cam is released from the adjustment hole by pulling the knob. Turning the eccentric cam one step causes 0.037mm-0.052mm head movement.

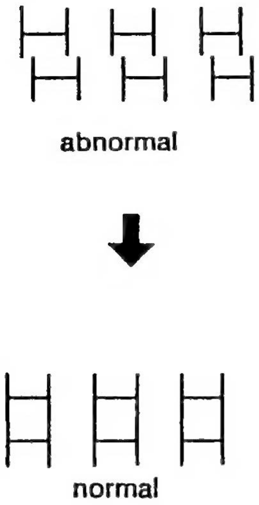
Note: Use only a round wire feeler gauge of the specified dimension for this adjustment.

Note: The head gap adjustment is required when replacing the head, platen, carriage, carriage shaft and eccentric cams.

Note: Moving the head gap lever towards the ① position increases the head gap clearance, and moving toward the ② position decreases the clearance.

5.2 Print Timing

This adjustment is used for 6 different speeds. The print timing is adjusted using the following procedure:



1. Turn on the power while holding the FF switch.
2. Select the print speed by pressing the COLUMN switch, and print the "H" pattern by pressing the SET switch.

Note: The "H" pattern is printed for 4 full lines for each speed.

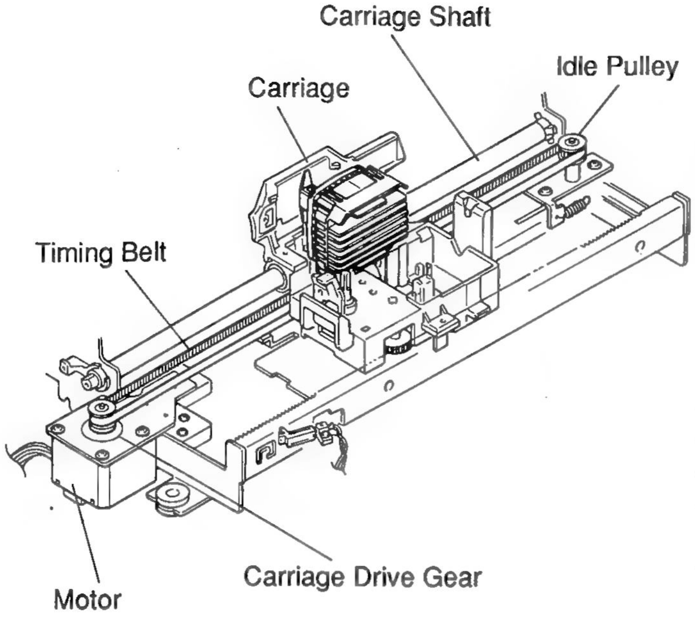
3. Check the print timing comparing the "H" pattern from line to line.
4. If the print timing is misaligned, adjust it by using the LF (Move to right) and FF (Move to left) switches and retry the printing for a final check.

Note: Pressing the switch moves the line in 1/2160 inch increments.

5. Press the FUNCTION switch to save the print timing into memory. The printer shifts to the normal print mode.

Note: If the second line of the "H" pattern is shifted by more than half of an "H" character, check that the printing mechanism is normal before starting adjustment.

6. Mechanical Function



6.1 Carriage Drive System

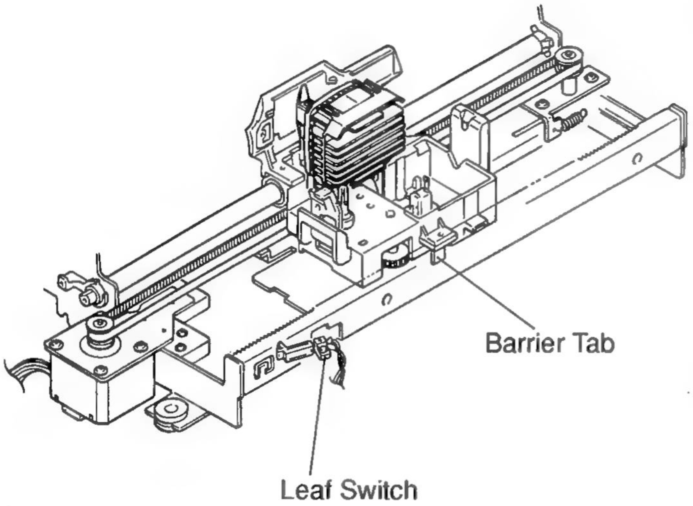
This operation uses a pulse motor to move the carriage 1/120 inch per single drive pulse. The carriage slides on the carriage guide plate and carriage shaft when spacing to the right and left. The printhead is fixed on the carriage by 2 screws.

6.1.1 Power Transmission Mechanism

The rotation of the carriage motor is transmitted to the carriage through the carriage drive pulley. The timing belt fixed under the carriage is looped around the idle pulley and carriage drive gear. This causes the carriage to move left and right along the carriage shaft. Also, the timing belt is given proper tension by the idle pulley tension spring hooked between pulley bracket and chassis.

6.1.2 Print Timing

Print timing for pica (1/60 inch) and elite (1/72 inch) is generated by a software operated timer. Refer to "Carriage Motor Drive Block" page 8-10.



6.1.3 Home Position Detector Mechanism

The home switch is a leaf switch located at the far left of the printer. Its function is to notify the CPU of the reference position of the carriage. During spacing operation, when the carriage approaches the left margin, the barrier tab, mounted under the carriage, actuates the home switch, generating the signal and indicating carriage position to the CPU.

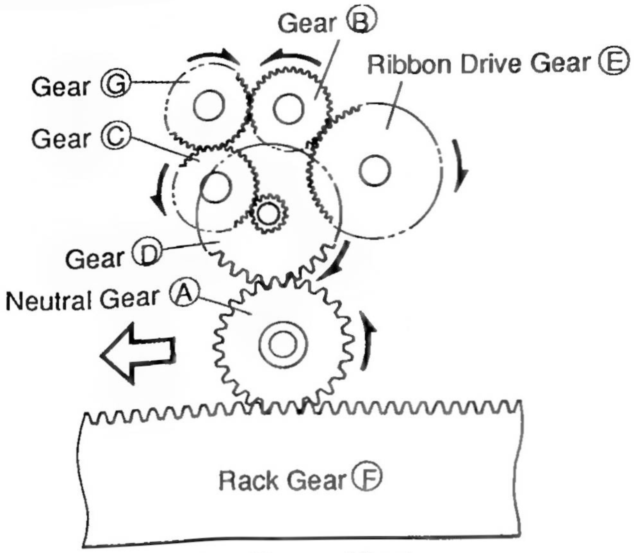

Gear Ⓑ
Ribbon Drive Gear Ⓔ
Gear Ⓖ
Gear Ⓒ
Gear Ⓓ
Neutral Gear Ⓐ
Rack Gear Ⓕ

Fig.1 (Bottom View)

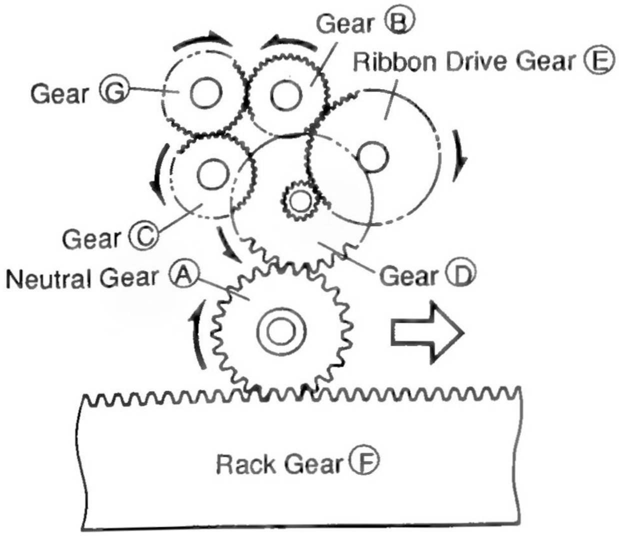

Gear Ⓑ
Ribbon Drive Gear Ⓔ
Gear Ⓖ
Gear Ⓒ
Neutral Gear Ⓐ
Gear Ⓓ
Rack Gear Ⓕ

Fig.2 (Bottom View)

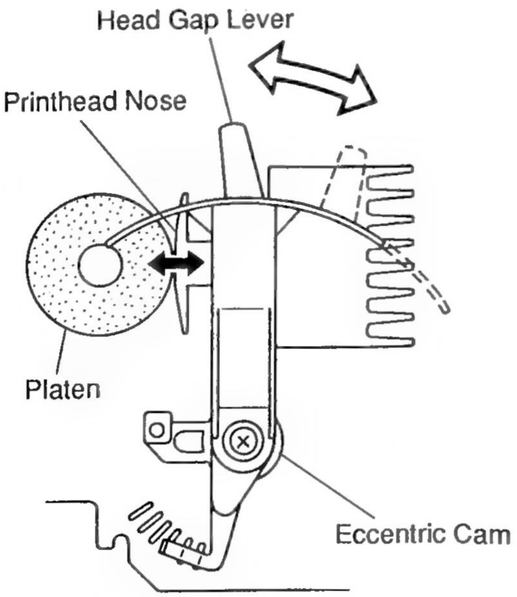
6.1.4 Ink Ribbon Cassette Drive Mechanism

This function performs the ribbon feed operation in accordance with the movement of the carriage. The ink ribbon cassette drive mechanism is shown in Figures 1 and 2.

This mechanism gives uniform ribbon feed regardless of the direction of the carriage movement. It consists of the rack gear Ⓕ , ribbon drive gear Ⓔ with the ribbon feed hub and 5 gears.

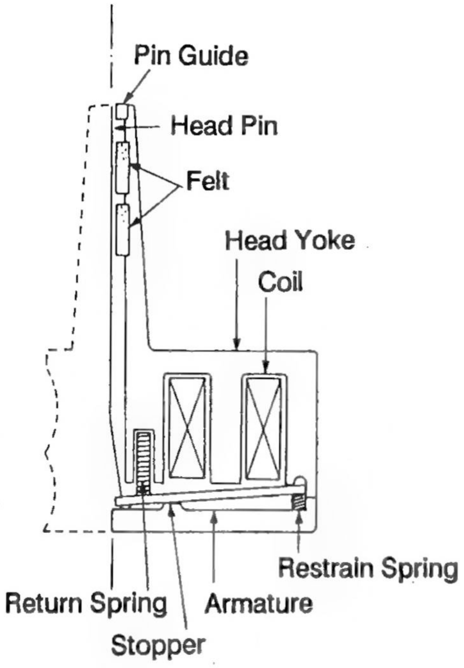
When the carriage moves to the right (Fig.1), rack gear Ⓕ turns neutral gear Ⓐ counter-clockwise, and then neutral gear Ⓐ engages with gear Ⓓ via gearⒸ, Ⓖ and Ⓑ which turns the ribbon drive gear Ⓔ clockwise with the hub.

When the Carriage moves to the left (Fig.2), rack gear Ⓕ turns the neutral gear Ⓐ clockwise. Gear Ⓓ then engages ribbon drive gear Ⓔ which turns the hub clockwise.


Head Gap Lever
Printhead Nose
Platen
Eccentric Cam

6.2 Paper Thickness Selection

Selection for the number of copies is made by changing the distance between the platen and the printhead nose tip. When the head gap lever is operated the carriage shaft revolves on the eccentric cams, moving the carriage forward or backward.



Pin Guide
Head Pin
Felt
Head Yoke
Coil
Restrain Spring
Return Spring
Armature
Stopper

6.3 Printhead

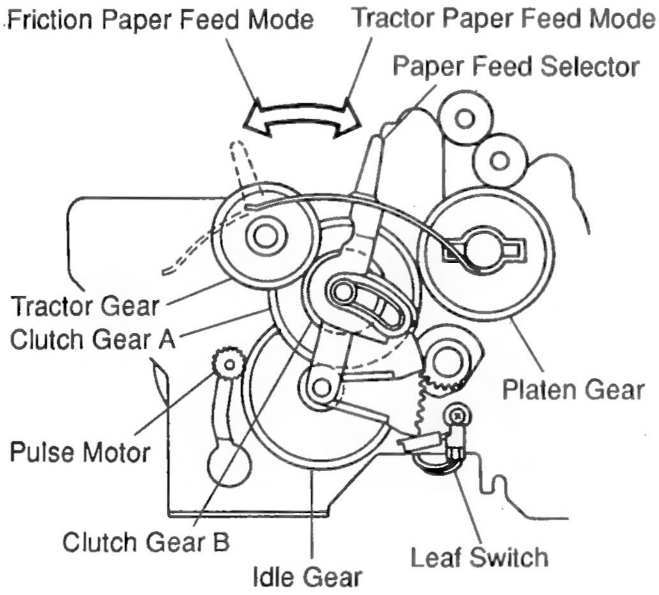
The printhead utilizes 24 electromagnets as a driving source, which causes the pins to strike through the ink ribbon against the platen onto the typing paper for matrix printing. The construction of the printhead is shown at left.

6.3.1 Power Transmission Mechanism

The set of 24 electromagnets consists of a one piece yoke and 24 coils. The armature which secures the pins is supported by this yoke.

6.3.2 Printhead Pin Operation

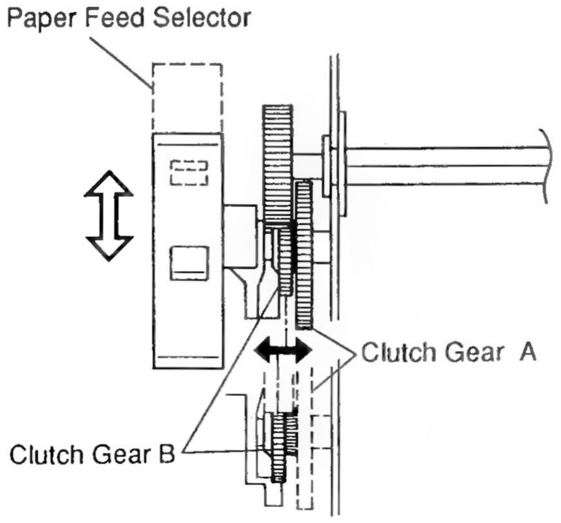
When a coil assembly is excited by a print signal, the armature is drawn in, and the pin secured by the armature is guided by the various guides to move in the direction of the platen. The pin strikes through the ribbon to the paper. Next, the return spring moves the armature and pin from the platen back to the rest position.



Friction Paper Feed Mode
Tractor Paper Feed Mode
Paper Feed Selector
Tractor Gear
Clutch Gear A
Platen Gear
Pulse Motor
Clutch Gear B
Idle Gear
Leaf Switch

6.4 Paper Feed Mechanism

A DC pulse motor is used for paper feed. Both continuous paper and single sheet can be fed by operating the paper feed selector. Continuous paper is loaded on both the left and right sides of the pin drum of the tractor drive device. Continuous paper is fed from the bottom or rear of the printer. Single sheet paper is fed from upper slot on top of the printer.



Paper Feed Selector
Clutch Gear A
Clutch Gear B

6.4.1 Power Transmission Mechanism

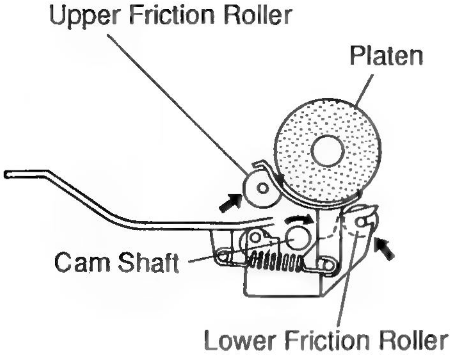
Rotation is transmitted from the pulse motor to the platen gear and tractor gear via the idle, clutch Gears A and B. The tractor gear consists of a drive gear and clutch mechanism which functions when operating the paper feed selector. The selector lever releases clutch gear B from clutch gear A and then releases the spring loaded frictioh rollers by rotating the cam shaft to apply the gripping force for Friction paper feed.

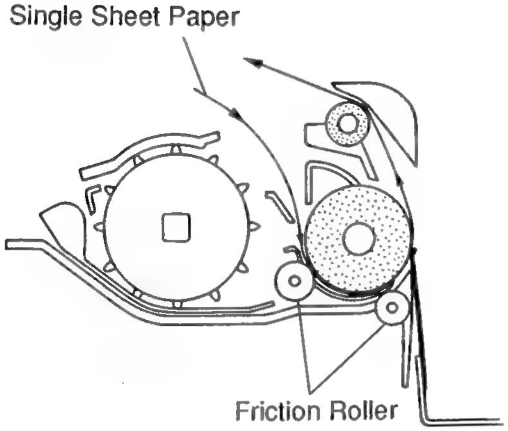
The tractor drive mechanism consists of a pin drum with a spring loaded paper hold cover and its drive shaft to feed continuous paper.

6.4.2 Paper Feed Mode

(1) Friction Paper Feed Mode

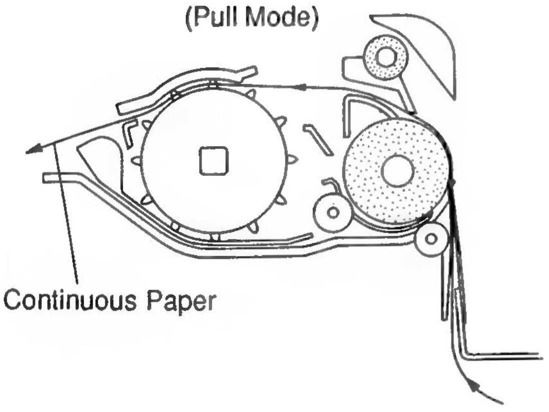
This mode is for feeding single-sheet paper from the slot on top of the printer in the friction paper feed position. By operating the paper feed selector, the tractor drive gear is disengaged from the tractor drive device, and the paper feed selector lever releases the spring loaded upper and lower friction rollers by rotating the cam shaft to apply gripping force to the platen. This enables paper feeding with platen rotation.

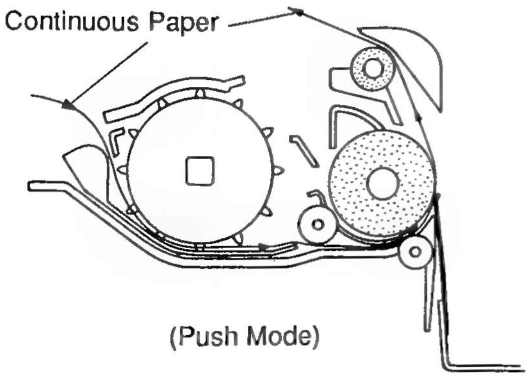

Upper Friction Roller
Platen
Cam Shaft
Lower Friction Roller


Single Sheet Paper
Friction Roller

(2) Tractor Paper Feed Mode

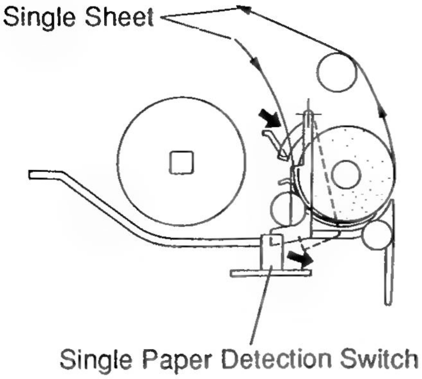
This mode is for feeding continuous paper from either the bottom or rear of the printer. By moving the paper feed selector to the "▥" position, Clutch Gear A engages Clutch Gear B by cam function. This enables turning of the tractor drive mechanism. Then the sector gear molded on the paper feed selector turns the cam shaft, which moves the upper and lower friction rollers away from the platen. This enables free paper passage from the rear feed. The paper feed selector also pushes the leaf switch to notify the CPU that the selector is in the "▯" position when turning the lever.
Continuous paper can be fed with either pull or push feed. Feed from the tractor upper side enables pull feed, and feed from the tractor lower side enables push feed.

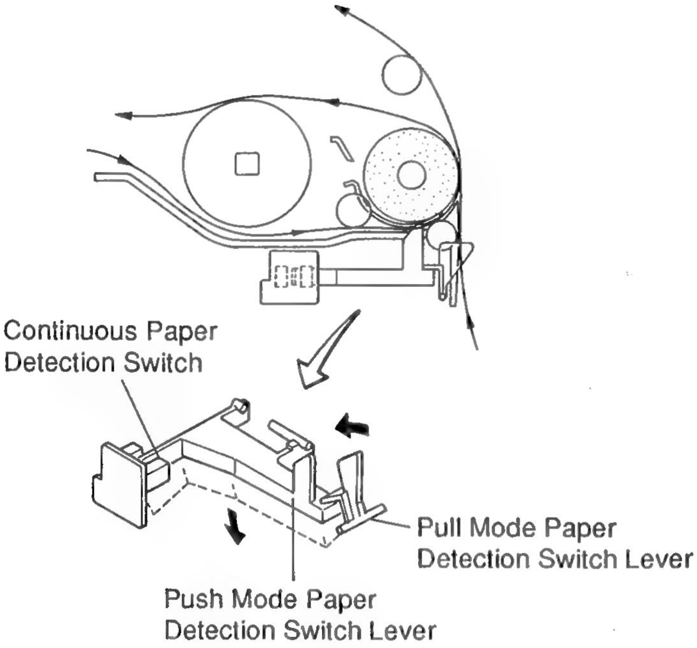

(Pull Mode)
Continuous Paper


Continuous Paper
(Push Mode)

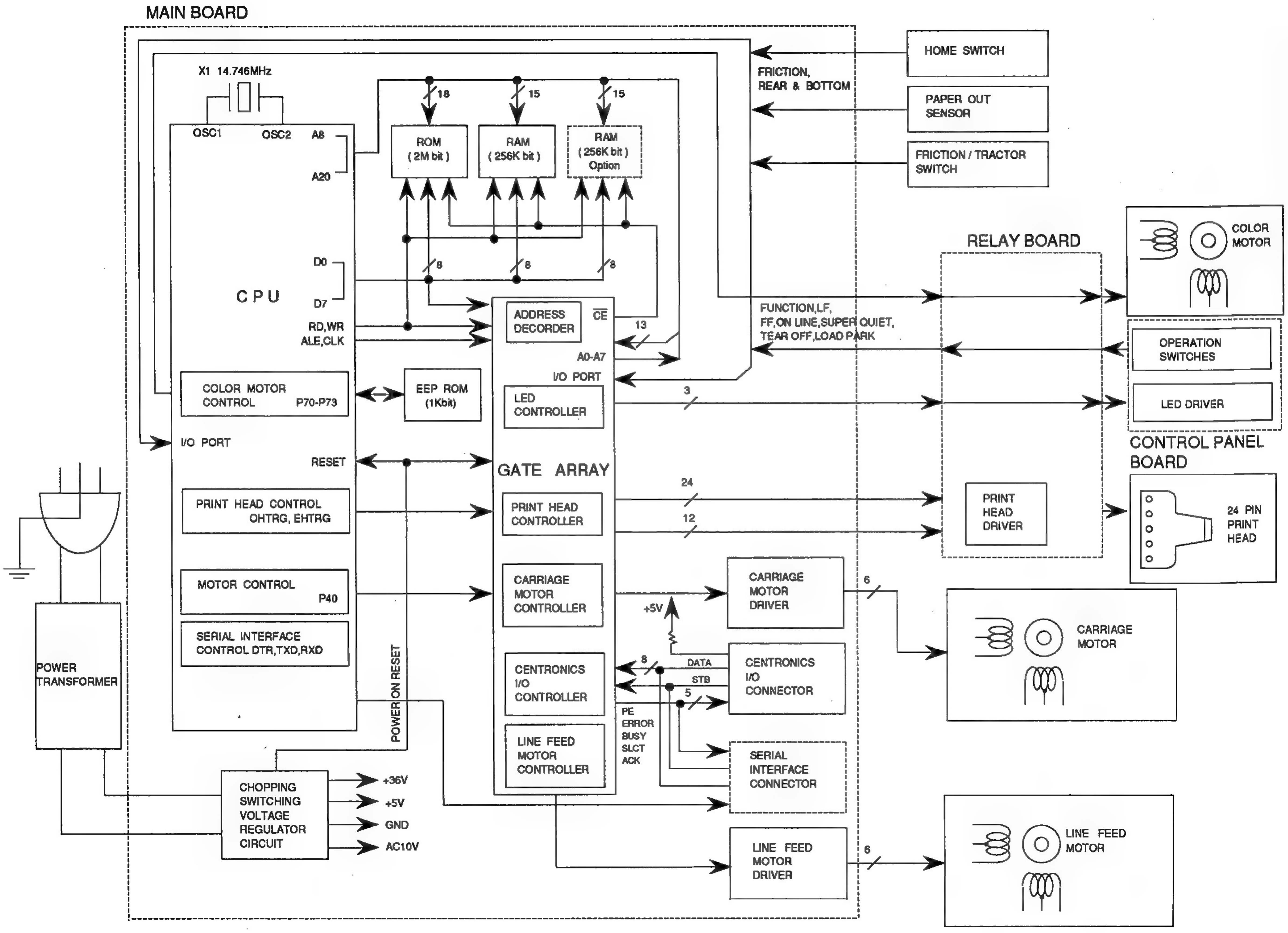
6.5 End of Paper Detector

The printer has two photo interrupters used for detecting paper out in continuous or a single paper feed. The upper photo interrupter is mounted under the upper slot. The bottom and rear photo interrupters are mounted under the tractor drive mechanism, and their contact levers are respectively placed in the upper slot, in the bottom slot and under the tractor pin wheel. When paper is out, the contact lever shuts off the photo switch by breaking the light beam, and a signal is sent to the CPU.


Single Sheet
Single Paper Detection Switch


Continuous Paper Detection Switch
Pull Mode Paper Detection Switch Lever
Push Mode Paper Detection Switch Lever

7. Electronic Circuit Block Diagram


MAIN BOARD
X1 14.746MHz
OSC1
OSC2
A8
A20
D0
D7
CPU
RD,WR
ALE,CLK
18
15
15
ROM
(2M bit)
RAM
(256K bit)
RAM
(256K bit)
Option
8
8
8
ADDRESS
DECORDER
CE
13
A0-A7
I/O PORT
LED
CONTROLLER
GATE ARRAY
PRINT HEAD
CONTROLLER
CARRIAGE
MOTOR
CONTROLLER
CENTRONICS
I/O
CONTROLLER
LINE FEED
MOTOR
CONTROLLER
COLOR MOTOR
CONTROL P70-P73
EEP ROM
(1Kbit)
I/O PORT
RESET
PRINT HEAD CONTROL
OHTRG, EHTRG
MOTOR CONTROL
P40
SERIAL INTERFACE
CONTROL DTR,TXD,RXD
POWER ON RESET
POWER
TRANSFORMER
CHOPPING
SWITCHING
VOLTAGE
REGULATOR
CIRCUIT
+36V
+5V
GND
AC10V
HOME SWITCH
FRICTION,
REAR & BOTTOM
PAPER OUT
SENSOR
FRICTION / TRACTOR
SWITCH
RELAY BOARD
FUNCTION,LF,
FF,ON LINE,SUPER QUIET,
TEAR OFF,LOAD PARK
3
24
12
PRINT
HEAD
DRIVER
COLOR
MOTOR
OPERATION
SWITCHES
LED DRIVER
CONTROL PANEL
BOARD
24 PIN
PRINT
HEAD
+5V
CARRIAGE
MOTOR
DRIVER
6
CARRIAGE
MOTOR
8
DATA
STB
5
CENTRONICS
I/O
CONNECTOR
PE
ERROR
BUSY
SLCT
ACK
SERIAL
INTERFACE
CONNECTOR
LINE FEED
MOTOR
DRIVER
6
LINE FEED
MOTOR

8. Electronic Circuit Descriptions

8.1 Principle of Operation

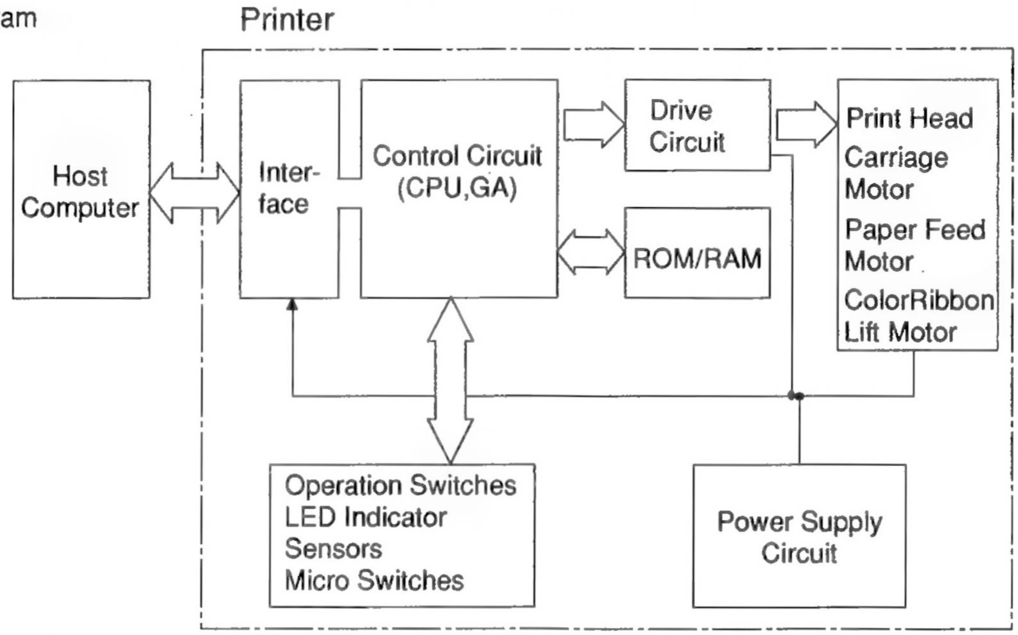
The KX-P2123 has two Micro switches and sensors. The home position switch sets a reference for the carriage and is necessary for aligning the first position. The Friction/Tractor switch detects the method of paper-feed by Friction or Tractor.

The paper out sensors detect paper end, and prevents printing operation when the printer is out of paper.

The printer has four drive circuits; carriage spacing motor, paper feed motor, Color ribbon lift motor and printhead.

The control panel is composed of switches and LEDs which indicate the various states of the printer.

Logic Diagram

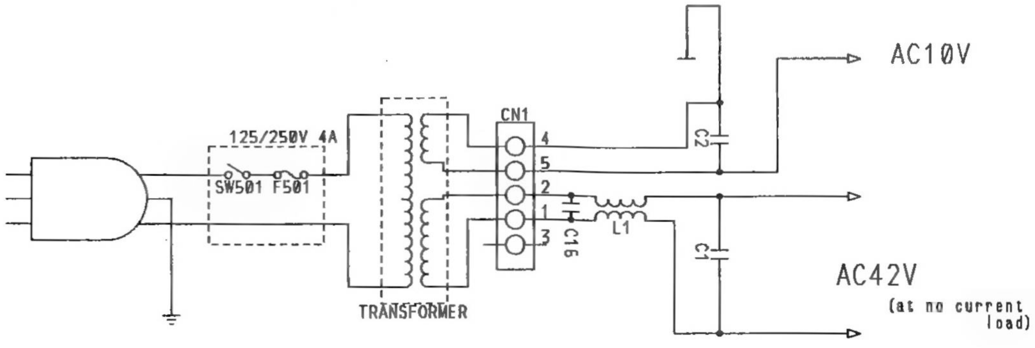

Printer
Host Computer
Inter-face
Control Circuit (CPU,GA)
Drive Circuit
ROM/RAM
Print Head
Carriage Motor
Paper Feed Motor
ColorRibbon Lift Motor
Operation Switches
LED Indicator
Sensors
Micro Switches
Power Supply Circuit

8.2 Circuitry

8.2.1 Power Supply Block

(1) Power and Filter Block

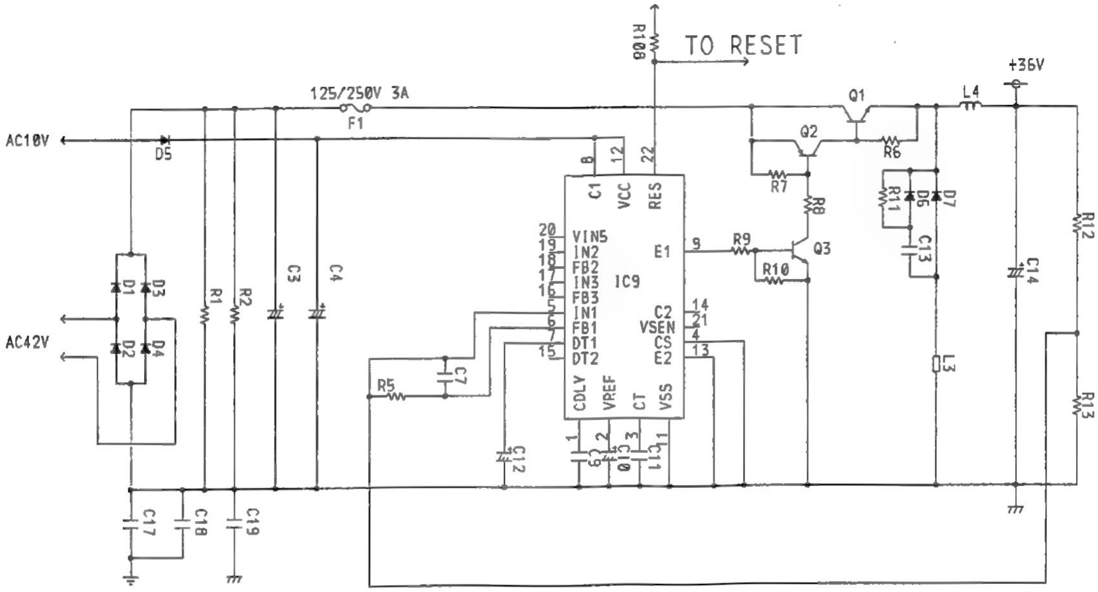
The fuse and switch are attached to a single printed circuit board. Primary power enters the power switch and passes through fuse F501 (4A). Absorption capacitors (C1,C2) together with choke(L1, L2), located near the secondary power circuit on the Main PCB, prevent noise from entering the circuit from the power source, and prevent noise from leaving the printer to the power source. As a result, the printer's digital circuitry operates very stably, unaffected by line noise, and prevents printer noise from affecting the outside power source.


125/250V 4A
SW501 F501
TRANSFORMER
CN1
4
5
2
1
3
C16
L1
C2
C1
AC10V
AC42V
(at no current load)

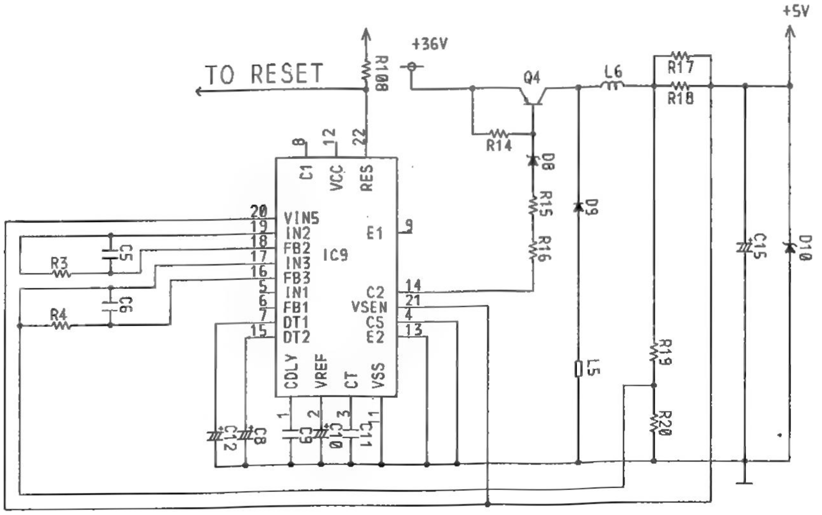
(2) Power Circuitry

Three kinds of voltage are provided by the Power Supply. +36V DC is used for motor and printhead drivers, +5V DC is for logic circuits and 10V AC is for the optional Serial Interface Board. The 10V AC is also halfwave rectified by D5 and supplied to IC9 for VCC. 42V AC, provided by the secondary side of the transformer, is rectified by the diode bridge circuit D1 ~ D4. +36V DC is produced from the rectified voltage by switching Q1 on and off and IC9 monitoring the circuit. +5V DC is produced from the +36V DC and Q4 being switched by IC9. IC9 (AN8081NK) is a pulse width modulation control IC (step-down type).

(a) DC+36V Switching Regulator Circuit


R108
TO RESET
+36V
125/250V 3A
F1
Q1
L4
Q2
R6
AC10V
D5
8
12
22
C1
VCC
RES
R7
R8
R11
D6
D7
R12
VIN5
IN2
FB2
IN3
FB3
IN1
FB1
DT1
DT2
IC9
E1
C2
VSEN
CS
E2
9
R9
R10
Q3
C13
C14
D1
D3
D2
D4
R1
R2
C3
C4
AC42V
R5
C7
CDLY
VREF
CT
VSS
L3
R13
C12
C9
C10
C11
C17
C18
C19

(b) DC+5V Circuit

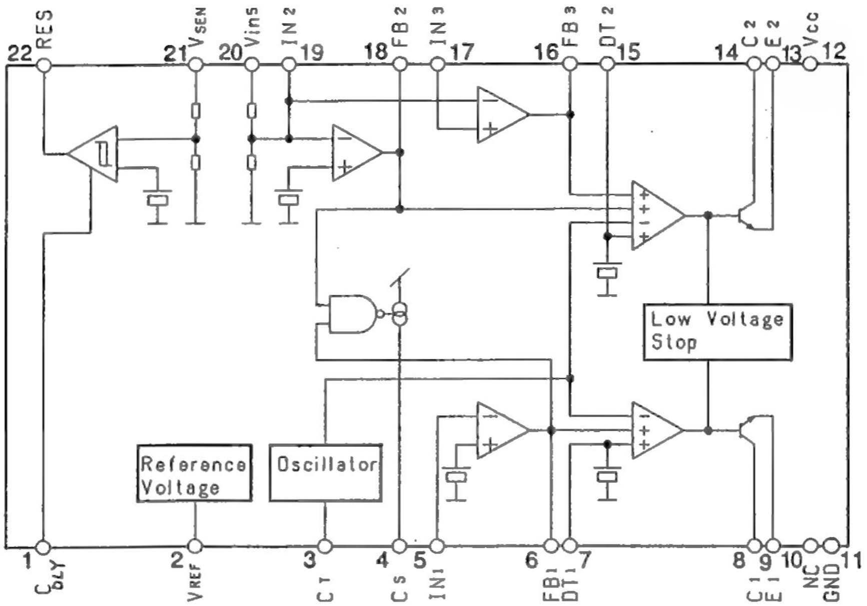

+5V
+36V
TO RESET
R108
Q4
L6
R17
R18
8
12
22
C1
VCC
RES
R14
D8
R15
R16
D9
VIN5
IN2
FB2
IN3
FB3
IN1
FB1
DT1
DT2
IC9
E1
C2
VSEN
CS
E2
R3
C5
R4
C6
C15
D10
L5
R19
R20
CDLY
VREF
CT
VSS
C12
C8
C9
C10
C11

(c) IC9 (AN8081NK)

This regulator IC consists of two PWM voltage control circuits and reset circuit. One PWM voltage control circuit is only for +5V DC output and the other is for variable voltage output. Over current protection is provided for +5V DC-GND short. DT1 and DT2 are used for "Soft Start" when power is turned on.
Switching frequency (fs)is determined by CT capacitor.

$$fs \approx 5x10^{-5}x\frac{1}{C}\ (Hz)$$

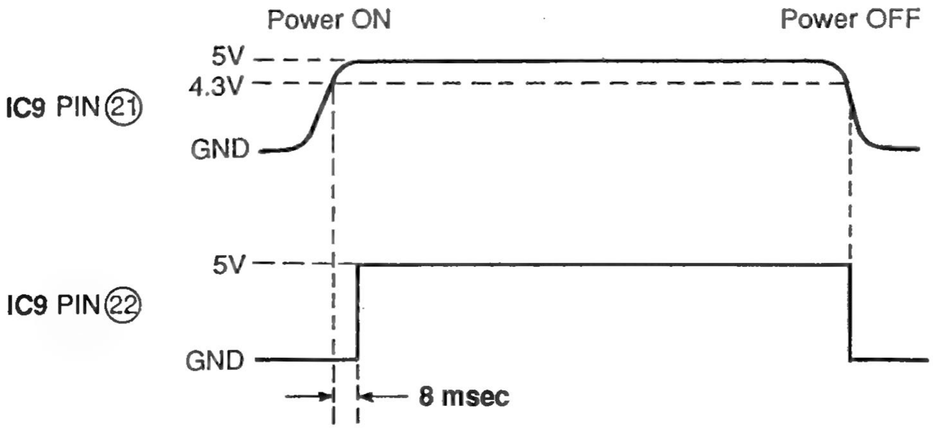
AN8081NK Block Diagram



22 RES
21 VSEN
20 Vin5
19 IN2
18 FB2
17 IN3
16 FB3
15 DT2
14 C2
13 E2
12 Vcc
1 CDLY
2 VREF
3 CT
4 CS
5 IN1
6 FB1
7 DT1
8 C1
9 E1
10 NC
11 GND
Low Voltage Stop
Reference Voltage
Oscillator

(d) Reset Circuit

The reset circuit is provided to initialize the gate array (IC6), the CPU (IC1) and the LED driver (IC600). About 8msec after the voltage at IC9 pin ㉑ reaches approximately 4.3V, the reset terminal RES (pin ㉒) changes from L to H.

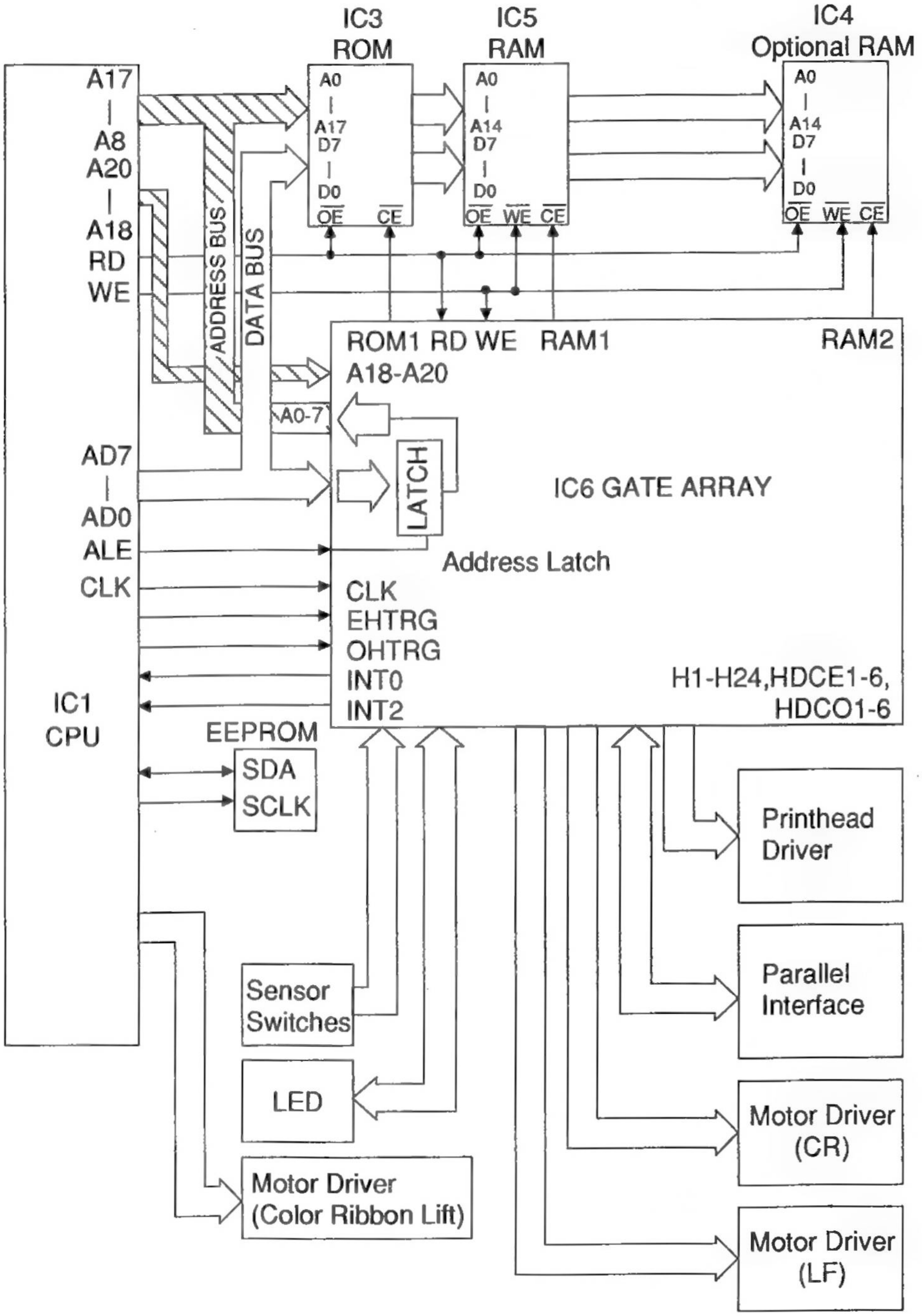


Power ON
Power OFF
IC9 PIN㉑
5V
4.3V
GND
IC9 PIN㉒
5V
GND
8 msec

8.2.2 CPU and Peripheral Circuit Block

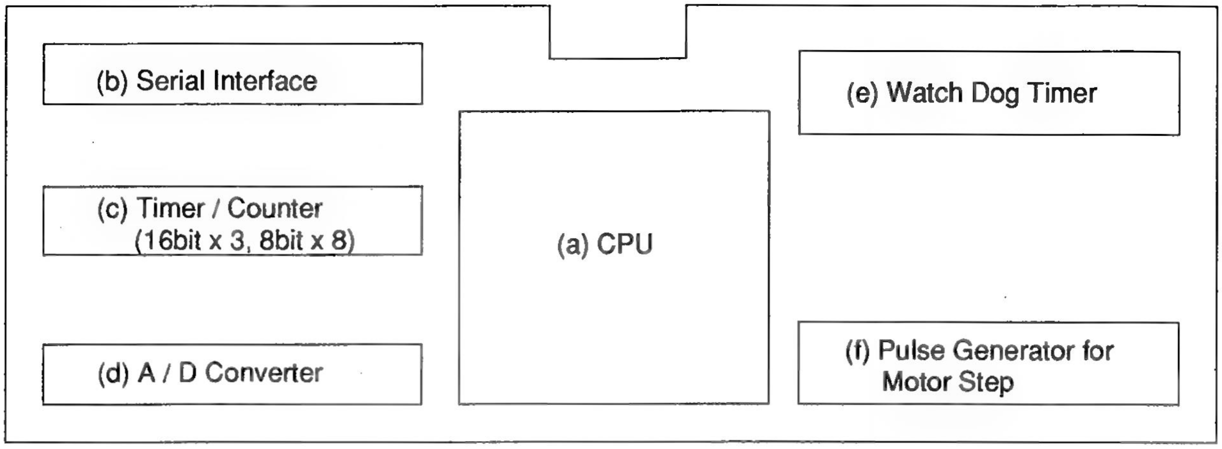
(1) This block diagram consists of the CPU (IC1), Gate Array (IC6), ROM (IC3), RAM (IC5) and optional RAM (IC4). It receives the data from the host computer, processes the input from the printhead overheat sensor and operation switches, and controls the carriage, paper feed motors, and the printhead.

ROM contains the operation program, which controls data processing and mechanical functions and the character generator, which determines the appearance of the characters.


IC3
ROM
IC5
RAM
IC4
Optional RAM
A0
A17
D7
D0
OE
CE
A0
A14
D7
D0
OE WE CE
A0
A14
D7
D0
OE WE CE
A17
A8
A20
A18
RD
WE
ADDRESS BUS
DATA BUS
ROM1 RD WE RAM1
RAM2
A18-A20
A0-7
LATCH
IC6 GATE ARRAY
Address Latch
AD7
AD0
ALE
CLK
CLK
EHTRG
OHTRG
INT0
INT2
H1-H24,HDCE1-6,
HDCO1-6
IC1
CPU
EEPROM
SDA
SCLK
Printhead
Driver
Parallel
Interface
Sensor
Switches
LED
Motor Driver
(CR)
Motor Driver
(Color Ribbon Lift)
Motor Driver
(LF)

(2) CPU Functions

MN18806 Block Diagram


(b) Serial Interface
(e) Watch Dog Timer
(c) Timer / Counter (16bit x 3, 8bit x 8)
(a) CPU
(f) Pulse Generator for Motor Step
(d) A / D Converter

(a) CPU
This block mainly consists of the Program Counter, Arithmetic Logical Unit, and Instruction Decoder. This block fetches the program from the ROM, decodes the instructions, and processes it accordingly.

(b) Serial Interface
This block supports a serial communication interface (synchronous and asynchronous). This block also has a baud rate generator of up to 9600 baud.

(c) Timer/Counter
This block consists of two 16-bit timers and four 8-bit timers. They are used for generating the timing for the printhead and carriage motor.

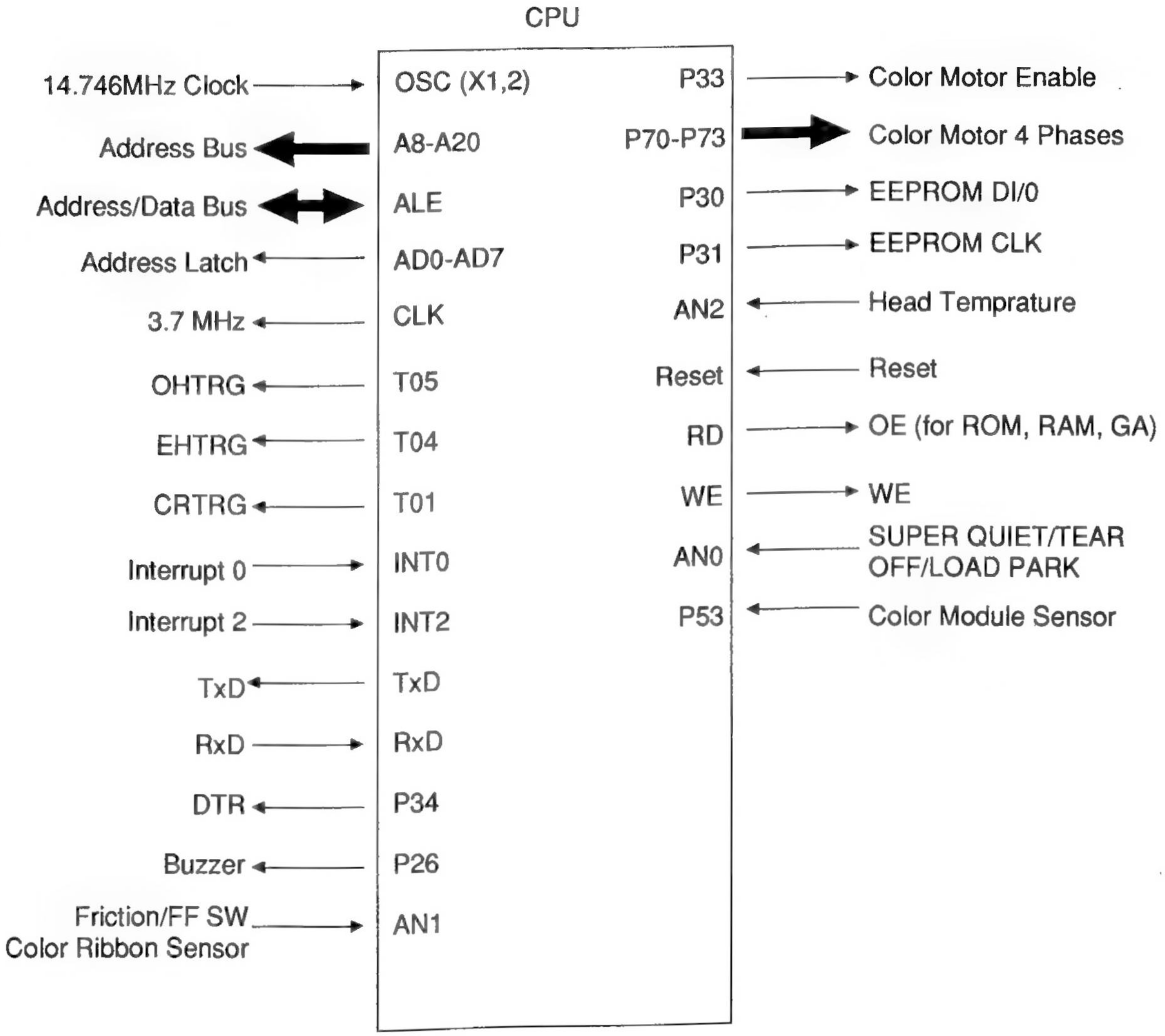
(d) A/D Converter
In this circuit, 8 bits/4 channel A/D Converters are prepared. One channel is used for sensing the overheat of the printhead and other channels are used for sensing the input of control panel switches, color module and color ribbon installation.

(e) Watch Dog Timer
When a program does not run properly, the CPU is reset.

(f) Pulse Generator for Motor Step
In this circuit the pulse generator for the stepper motor is prepared. This function is used for the color ribbon lift motor. Motor driving pattern is generated automatically when the generator receives the starting signal. The pattern is synchronized with the output of the timer, which determines motor pulse rate.

(3) CPU Pin Functions

The CPU has total of 64 pins and an 14.746MHz clock. It controls a 256KB ROM, 32KB RAM, 32KB optional RAM, and an optional interface board. These RAMs are used as an input buffer, line buffer, bit image buffer, and download area. The CPU pin functions are as follows.



CPU
14.746MHz Clock
Address Bus
Address/Data Bus
Address Latch
3.7 MHz
OHTRG
EHTRG
CRTRG
Interrupt 0
Interrupt 2
TxD
RxD
DTR
Buzzer
Friction/FF SW
Color Ribbon Sensor
OSC (X1,2)
A8-A20
ALE
AD0-AD7
CLK
T05
T04
T01
INT0
INT2
TxD
RxD
P34
P26
AN1
P33
P70-P73
P30
P31
AN2
Reset
RD
WE
AN0
P53
Color Motor Enable
Color Motor 4 Phases
EEPROM DI/0
EEPROM CLK
Head Temprature
Reset
OE (for ROM, RAM, GA)
WE
SUPER QUIET/TEAR OFF/LOAD PARK
Color Module Sensor

(4) Gate Array
The gate array (IC6) is a 160 pin Flat Package and it consists of seven blocks.

(a) Head Drive Controller
The 24 Print Head Pins are controlled by an even or odd pin group controller. The Head Pin Trigger Pulse triggers generation of the Head Pin Signal from each group.

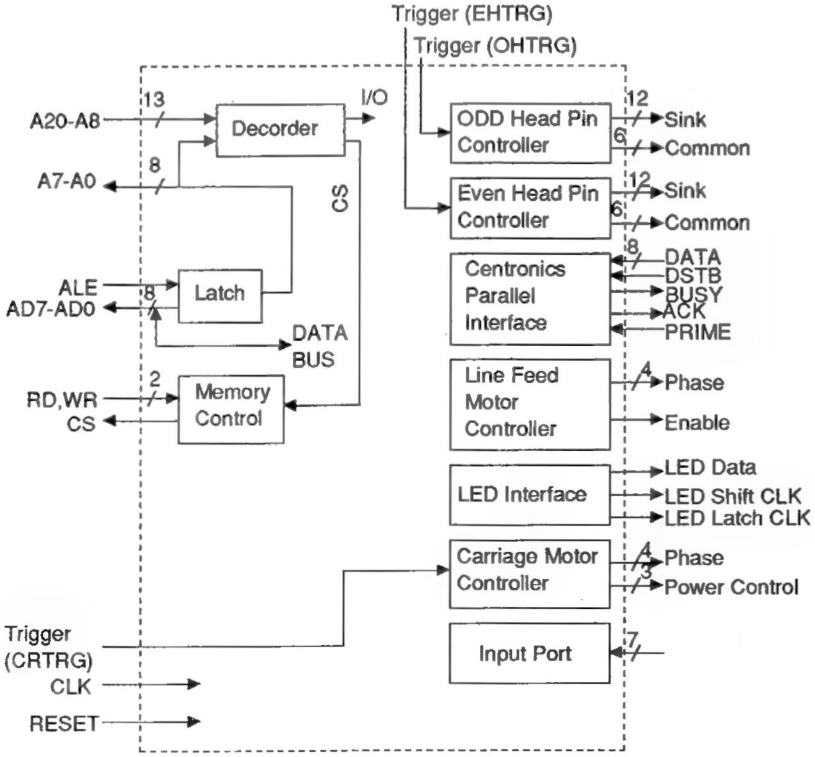
(b) Decoder
It is used for accessing ROM and RAMs, and used for refreshing RAMs.

(c) Handshake Interface
In this gate array, the Centronics Parallel interface (usually called Handshake Interface) is prepared. The busy signal to the host computer is generated automatically when receiving the DSTB (data strobe) signal. The ACK (acknowledge) signal is also generated automatically when the busy signal turns to L level (Ready state).

(d) Pulse Generator for Stepper Motor
In this gate array the pulse generator for the stepper motor is prepared. This function is used for the carriage spacing motor and line feed motor. The motor driving pattern is generated automatically when the generator receives the starting signal. This pattern is synchronized with the output of the timer which determines motor pulse rate.

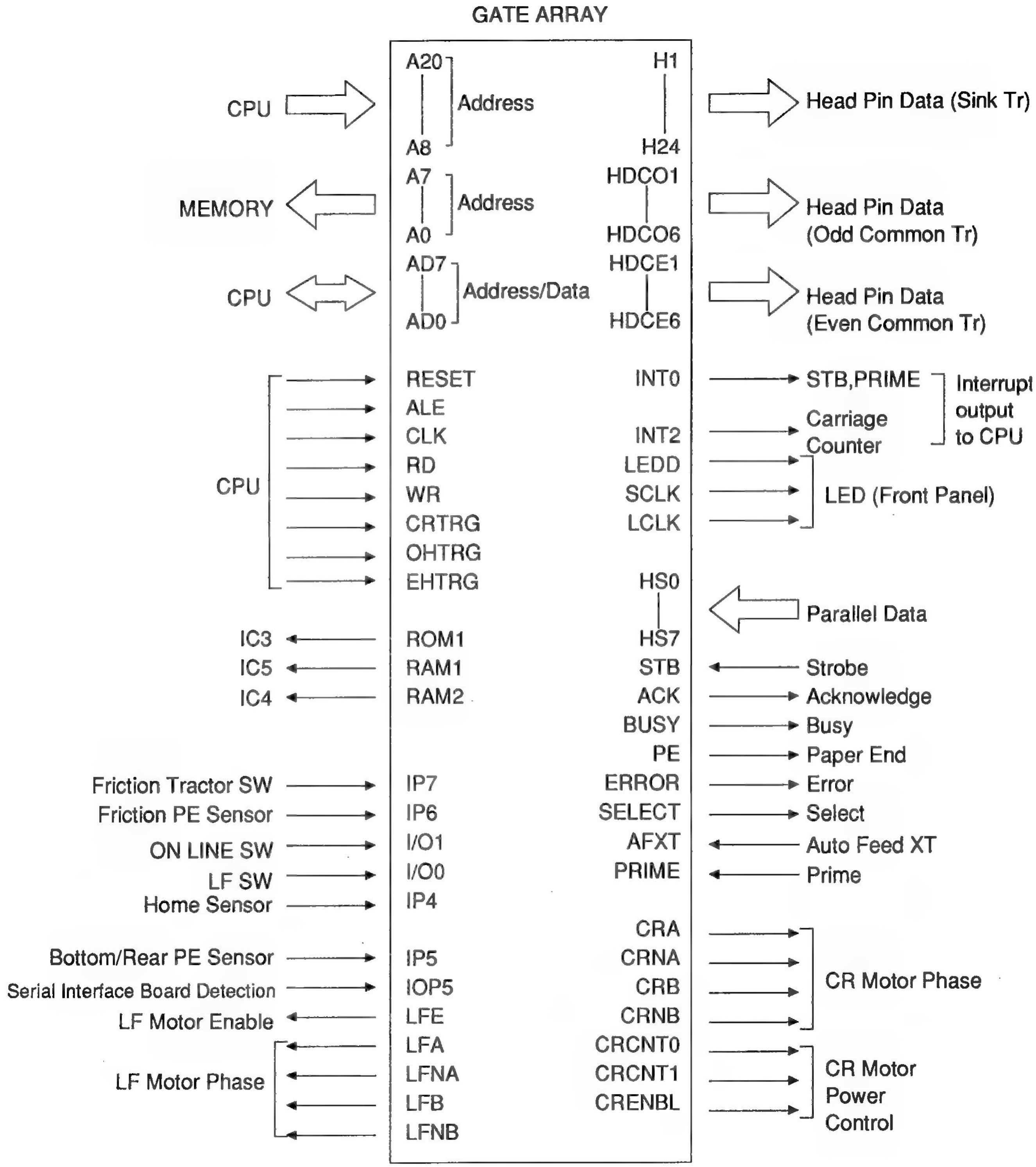
(e) Input Port
Input port is used for control panel switches, sensors and serial interface detection.

(f) LED Interface
Three control signals are sent from the gate array to control the LED driver IC. The LED data signal determines which LED is going to be lit. The data is serially sent and synchronized with the Shift CLK and Latch LCK signals.


Trigger (EHTRG)
Trigger (OHTRG)
A20-A8
13
Decorder
I/O
A7-A0
8
CS
ALE
AD7-AD0
8
Latch
DATA BUS
RD,WR
2
CS
Memory Control
Trigger (CRTRG)
CLK
RESET
ODD Head Pin Controller
12
Sink
6
Common
Even Head Pin Controller
12
Sink
6
Common
Centronics Parallel Interface
8
DATA
DSTB
BUSY
ACK
PRIME
Line Feed Motor Controller
4
Phase
Enable
LED Interface
LED Data
LED Shift CLK
LED Latch CLK
Carriage Motor Controller
4
Phase
3
Power Control
Input Port
7

(5) Gate Array Pin Function

The pin functions are as follows.


GATE ARRAY
CPU
A20
A8
Address
H1
H24
Head Pin Data (Sink Tr)
MEMORY
A7
A0
Address
HDCO1
HDCO6
Head Pin Data
(Odd Common Tr)
CPU
AD7
AD0
Address/Data
HDCE1
HDCE6
Head Pin Data
(Even Common Tr)
CPU
RESET
ALE
CLK
RD
WR
CRTRG
OHTRG
EHTRG
INT0
STB,PRIME
INT2
Carriage
Counter
Interrupt
output
to CPU
LEDD
SCLK
LCLK
LED (Front Panel)
HS0
HS7
Parallel Data
IC3
IC5
IC4
ROM1
RAM1
RAM2
STB
Strobe
ACK
Acknowledge
BUSY
Busy
PE
Paper End
Friction Tractor SW
IP7
ERROR
Error
Friction PE Sensor
IP6
SELECT
Select
ON LINE SW
I/O1
AFXT
Auto Feed XT
LF SW
I/O0
PRIME
Prime
Home Sensor
IP4
CRA
Bottom/Rear PE Sensor
IP5
CRNA
Serial Interface Board Detection
IOP5
CRB
CR Motor Phase
LF Motor Enable
LFE
CRNB
LF Motor Phase
LFA
LFNA
LFB
LFNB
CRCNT0
CRCNT1
CRENBL
CR Motor
Power
Control

8.2.3 Parallel Interface Circuit

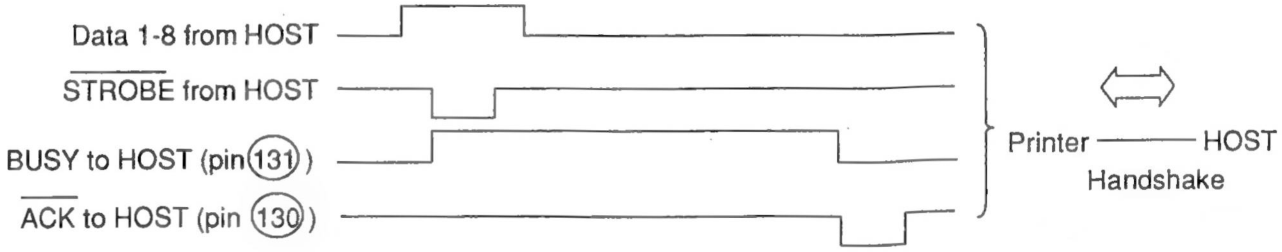
The Interface Block receives data from the host computer and generates the appropriate status signals. The handshake method is described in the following steps.

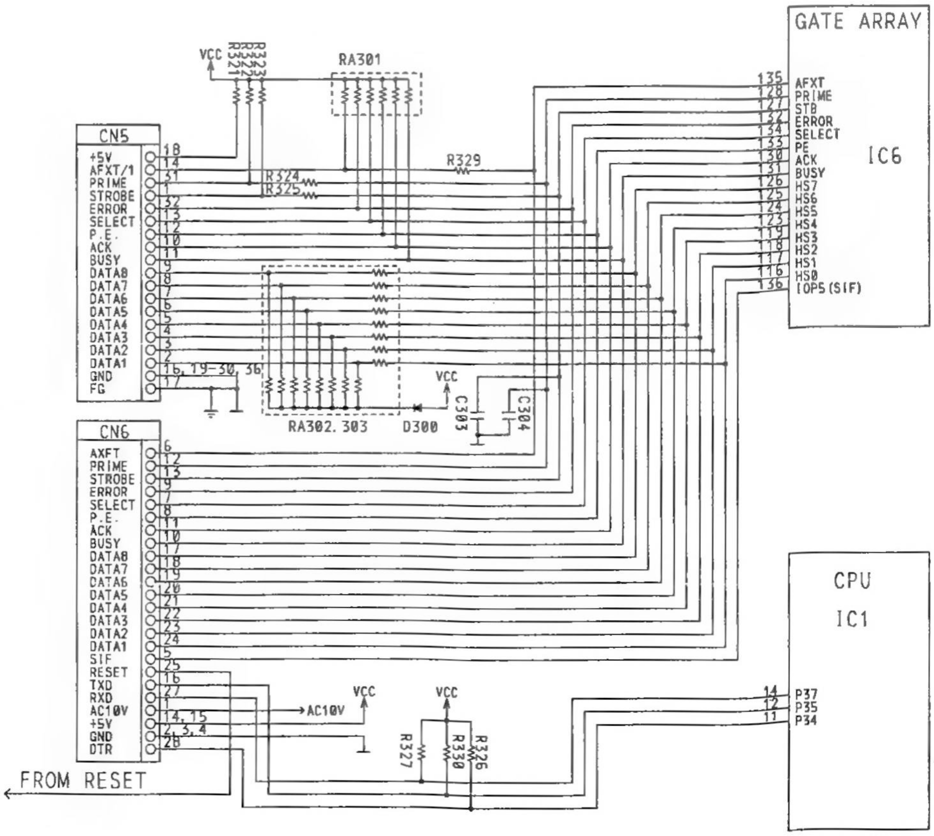
Process

(1) A STROBE signal is sent from the host computer and is used to set the internal latch of the Gate Array. At the same time Gate Array pin (131) sends a BUSY signal to the host computer.
(2) The CPU checks the internal latch of the Gate Array periodically and checks whether a STROBE is sent or not.
(3) If a STROBE signal has been sent, the CPU reads the data through HS ports (HS0-HS7) of the Gate Array. Then the internal latch of the Gate Array is cleared automatically.
(4) When the BUSY signal disappears, an ACK (Acknowledge) signal is sent to the host computer automatically during the time determined by software.
(5) The CPU then judges the received data as to whether it is a character code, control code or bit image data and processes the data accordingly.
(6) The CPU processes another command (for instance; operation switch state check, motor drive during print).

Thus the data received by handshake is accomplished.

Timing Chart

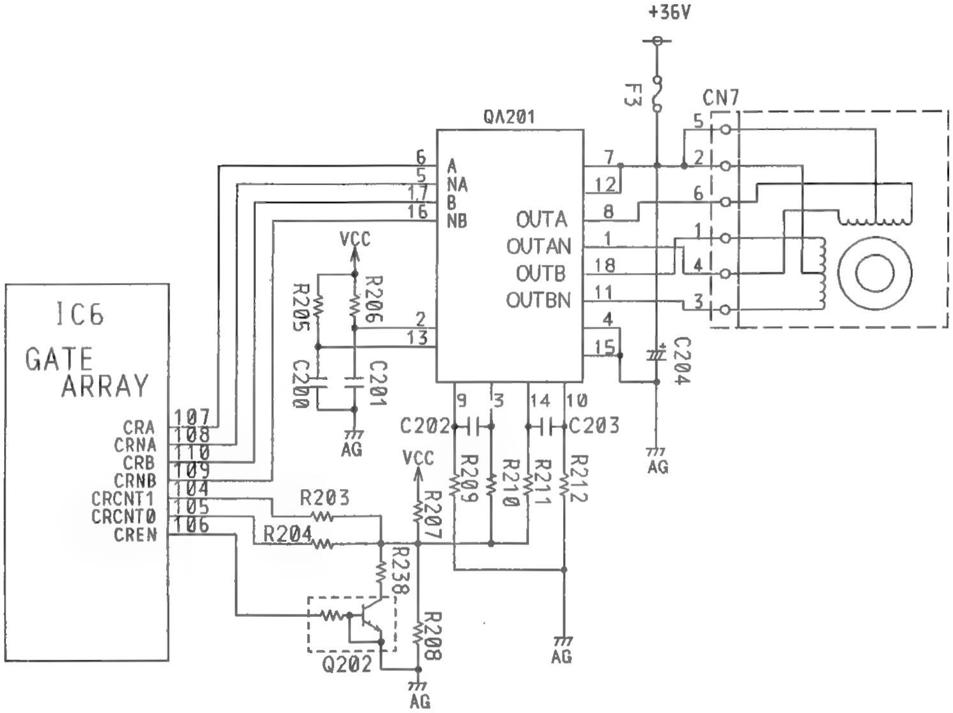

Data 1-8 from HOST
STROBE from HOST
BUSY to HOST (pin(131))
ACK to HOST (pin (130))
Printer ——— HOST
Handshake


GATE ARRAY
IC6
AFXT
PRIME
STB
ERROR
SELECT
PE
ACK
BUSY
HS7
HS6
HS5
HS4
HS3
HS2
HS1
HS0
IOP5 (SIF)
135
128
127
132
134
133
130
131
126
125
124
123
119
118
117
116
136
VCC
R320
R321
R322
R323
RA301
R324
R325
R329
CN5
+5V
AFXT/1
PRIME
STROBE
ERROR
SELECT
P.E.
ACK
BUSY
DATA8
DATA7
DATA6
DATA5
DATA4
DATA3
DATA2
DATA1
GND
FG
18
14
31
1
32
13
12
10
11
9
8
7
6
5
4
3
2
16, 19-30, 36
17
RA302. 303
D300
VCC
C303
C304
CN6
AXFT
PRIME
STROBE
ERROR
SELECT
P.E.
ACK
BUSY
DATA8
DATA7
DATA6
DATA5
DATA4
DATA3
DATA2
DATA1
SIF
RESET
TXD
RXD
AC10V
+5V
GND
DTR
6
12
13
9
7
8
11
10
17
18
19
20
21
22
23
24
5
25
16
27
1
14, 15
2, 3, 4
28
AC10V
VCC
VCC
R327
R330
R326
CPU
IC1
P37
P35
P34
14
12
11
FROM RESET

8.2.4 Carriage Motor Drive Block

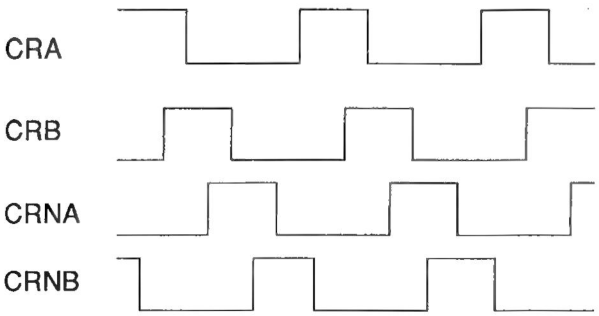
The Carriage motor is driven by the four signals from CRA, CRB, CRNA and CRNB, and is driven by 1-2 phase driving system.

QA201 (SLA7024M) is a current chopper type Hybrid IC and is used as a carriage motor driver. Four phase signals (A,$\overline{A}$,B,$\overline{B}$,) are generated by IC6 and sent to QA201. QA201 then provides the phase signals to drive the carriage motor.
The chopper frequency of QA201 is determined by C200, C201, R205 and R206. The motor coil current is varied depending on the print mode. QA201 controls the current level by comparing predetermined voltage levels at pins③and ⑭. These voltage levels are changed according to the print mode. This is accomplished by a H or L signal from CRCNT1 and CRNT0 and a resistor network. This network consist of R207, R208 for slow carrier movement, R207, R208, R204 for Draft printing and R207, R208, R203 for LQ printing. The motor current level is controlled by QA201 comparing the reference voltage with voltage level at R209 and R212.



+36V
F3
CN7
QA201
A
NA
B
NB
OUTA
OUTAN
OUTB
OUTBN
IC6
GATE
ARRAY
CRA
CRNA
CRB
CRNB
CRCNT1
CRCNT0
CREN
107
108
110
109
104
105
106
VCC
R205
R206
C200
C201
AG
C202
C203
C204
R209
R210
R211
R212
R203
R204
R207
R208
R238
Q202

Timing Chart



Carriage Motor Coil Resistance Value

Pin No. (CN7)	Resistance Value
6-5	6.8 ±0.7 ohms
4-5	6.8 ±0.7 ohms
1-2	6.8 ±0.7 ohms
3-2	6.8 ±0.7 ohms

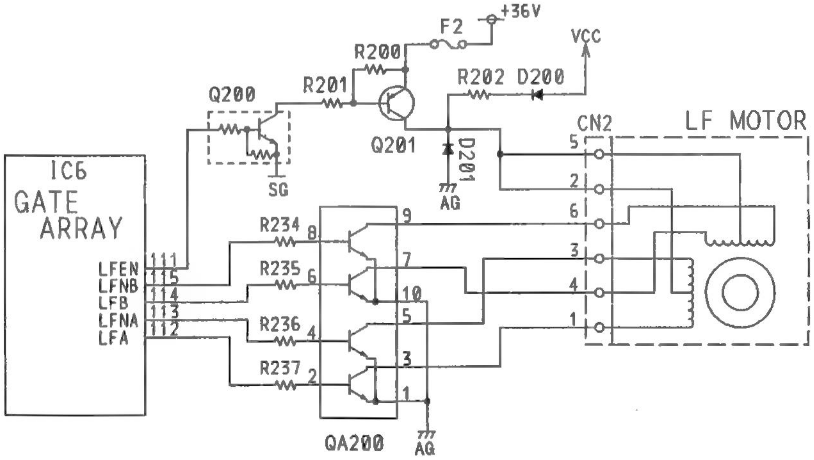
Pulse Rate Chart

Relation between the printing mode and the pulse rate is shown in the chart.

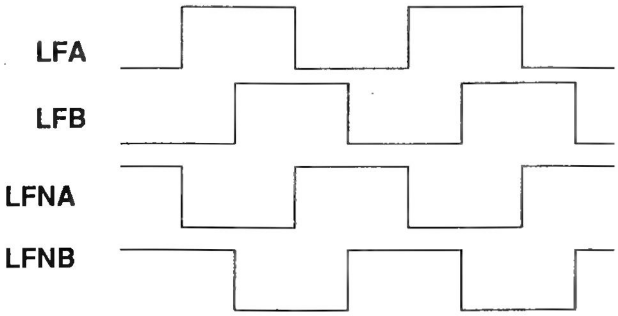
Printing Mode		Pulse Rate(PPS)	Current Control	
			CRCNT0	CRCNT1
Holding State		0	H	H
DRAFT	10CPI	3840	L	H
	12CPI	3840	L	H
	15CPI	3840	L	H
	17CPI	1920	L	L
	20CPI	1920	L	L
LQ	10CPI	1280	L	L
	12CPI	1280	L	L
	15CPI	1280	L	L
	17CPI	1280	L	L
	20CPI	1280	L	L

8.2.5 Paper Feed Motor Drive Block

During paper feed, IC6 sets LFEN at the H level and turns on Q200 and Q201. +36V is then fed to the motor. The driving method by LFA, LFNA, LFB, LFNB is a 2-2 driving system and the pulse rate is 200 pulses per second. When paper feed is not active, Q201 is turned off by a of LFEN (pin (111)) L level signal and then a holding voltage (about 2V) is applied to the motor through R202.


+36V
F2
VCC
R200
R201
R202 D200
Q200
Q201
D201
SG
AG
CN2
LF MOTOR
IC6
GATE ARRAY
LFEN
LFNB
LFB
LFNA
LFA
111
115
114
113
112
R234
R235
R236
R237
8
6
4
2
9
7
10
5
3
1
5
2
6
3
4
1
QA200
AG

Timing Chart



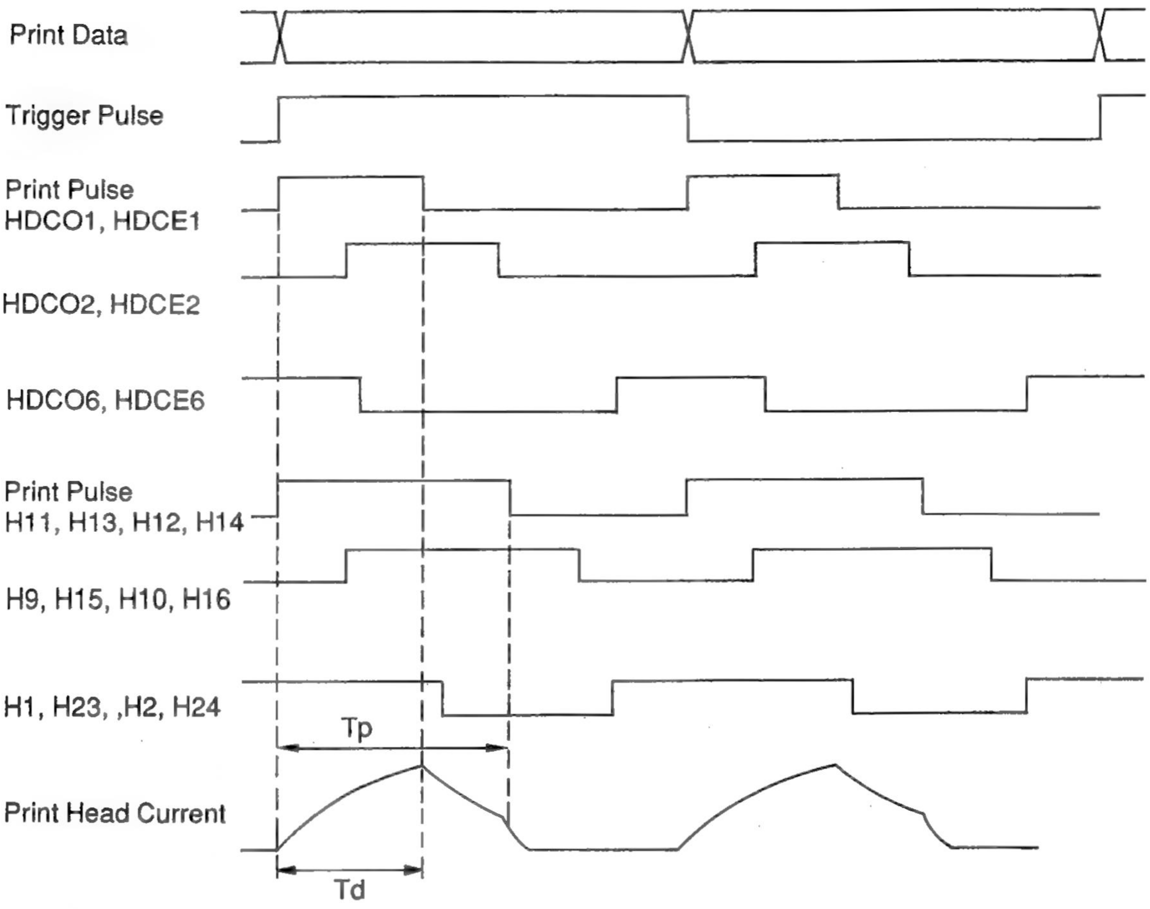
Paper Feed Motor

Pin No. (CN2)	Resistance Value
1-2	80 ±8 ohms
3-2	80 ±8 ohms
4-5	80 ±8 ohms
6-5	80 ±8 ohms

8.2.6 Head Drive Block

This block consists of QA400-408 and IC7-8. QA400-405 control each pin and QA406-408 control the power supplied to the printhead.
The CPU sends the data H1-H24 of IC6 (Gate Array). Then the CPU also sets printing pulse and triggers TO4 and TO5 terminal of IC1. During this time, the head pin solenoids are fired by QA400-405 according to the data. The power supplied to the printhead is controlled by IC6 through QA406-408.
A thermistor is attached in the printhead and is used for detecting overheat of printhead.

Timing Chart


Print Data
Trigger Pulse
Print Pulse
HDCO1, HDCE1
HDCO2, HDCE2
HDCO6, HDCE6
Print Pulse
H11, H13, H12, H14
H9, H15, H10, H16
H1, H23, ,H2, H24
Tp
Print Head Current
Td

Print Pulse Time

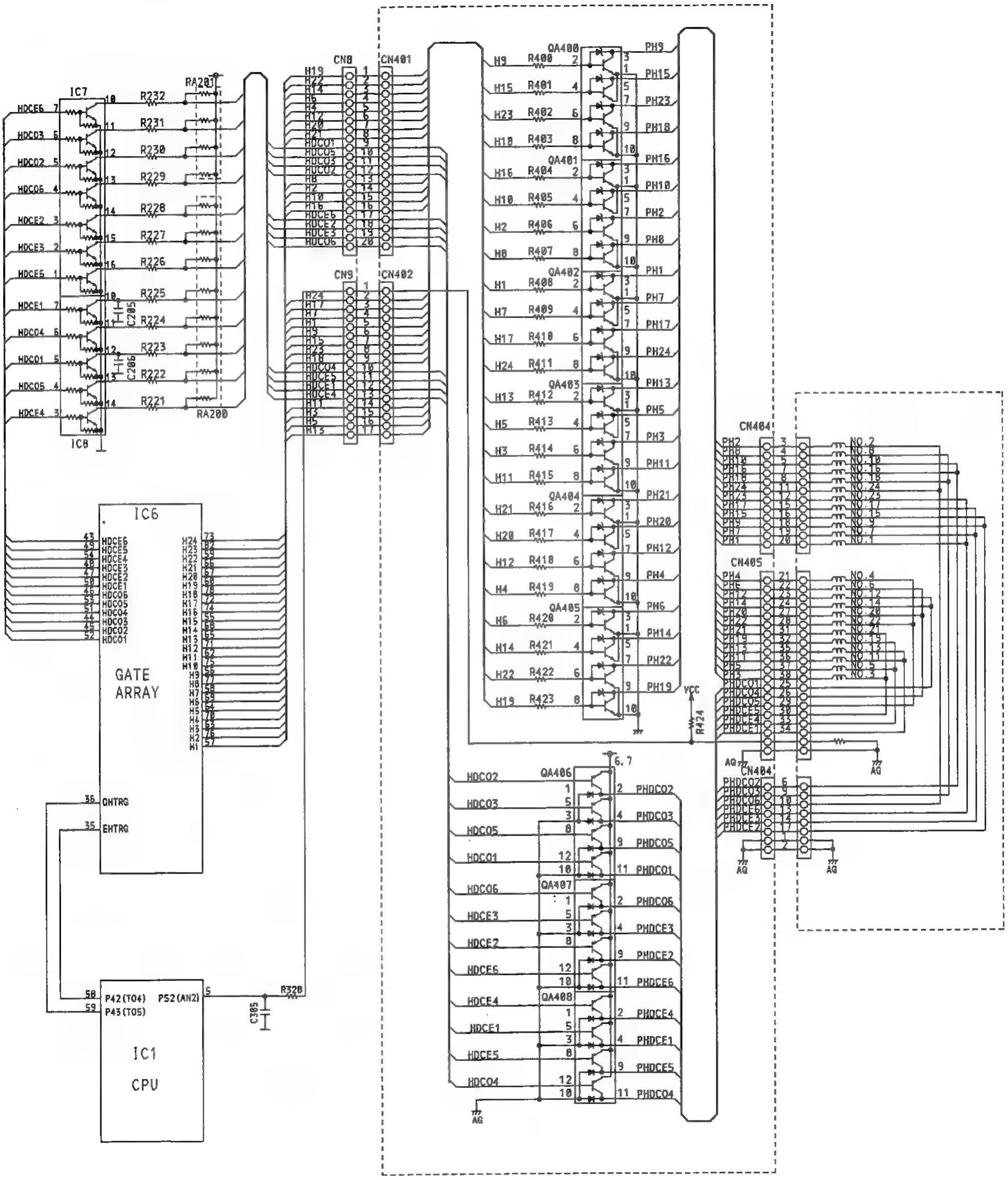
Print Mode	Td	Tp
Draft	about 245 μ sec	about 480 μ sec
Bit Image	about 245 μ sec	about 480 μ sec

Printhead

Pin No. (CN404)	Resistance Value	Pin No. (CN405)	Resistance Value
3-10	20.0 ± 1 ohms	21-29	20.0 ± 1 ohms
11-10	20.0 ± 1 ohms	21-28	20.0 ± 1 ohms
4-9	20.0 ± 1 ohms	22-26	20.0 ± 1 ohms
8-9	20.0 ± 1 ohms	22-27	20.0 ± 1 ohms
5-6	20.0 ± 1 ohms	23-24	20.0 ± 1 ohms
7-6	20.0 ± 1 ohms	23-25	20.0 ± 1 ohms
12-13	20.0 ± 1 ohms	31-30	20.0 ± 1 ohms
20-13	20.0 ± 1 ohms	31-38	20.0 ± 1 ohms
15-14	20.0 ± 1 ohms	32-33	20.0 ± 1 ohms
19-14	20.0 ± 1 ohms	32-37	20.0 ± 1 ohms
16-17	20.0 ± 1 ohms	35-34	20.0 ± 1 ohms
18-17	20.0 ± 1 ohms	35-36	20.0 ± 1 ohms
		39-40	Less than 50K ± 5 Kohms (at 25℃)

Print Head Driver

Circuit Diagram


IC7
IC8
RA201
RA200
R221
R222
R223
R224
R225
R226
R227
R228
R229
R230
R231
R232
C205
C206
IC6
GATE ARRAY
OHTRG
EHTRG
IC1
CPU
P42(TO4)
P43(TO5)
P52(AN2)
R328
C305
CN8
CN9
CN401
CN402
QA400
QA401
QA402
QA403
QA404
QA405
QA406
QA407
QA408
R424
VCC
CN404
CN405
AG
HDCE6
HDCO3
HDCO2
HDCO6
HDCE2
HDCE3
HDCE5
HDCE1
HDCO4
HDCO1
HDCO5
HDCE4
PHDCO2
PHDCO3
PHDCO5
PHDCO1
PHDCO6
PHDCE3
PHDCE2
PHDCE6
PHDCE4
PHDCE1
PHDCE5
PHDCO4
6, 7

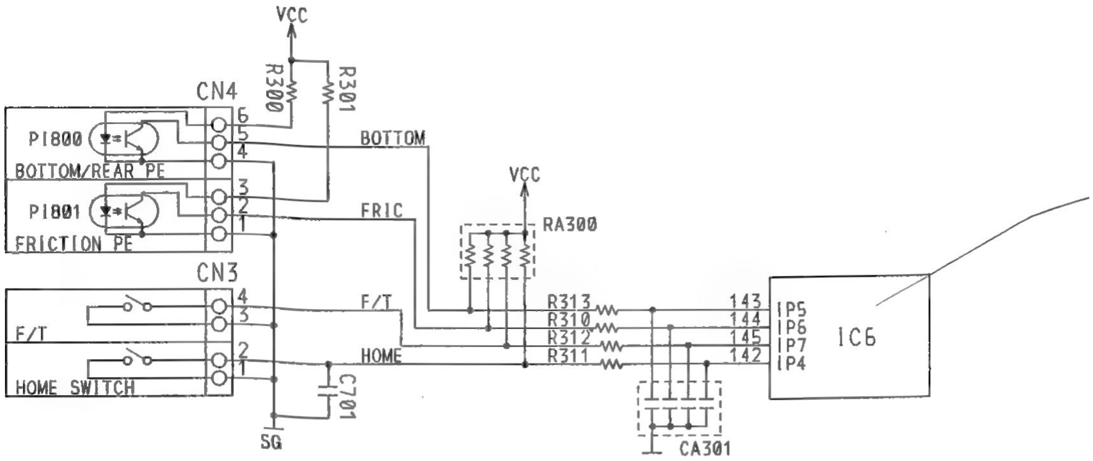
8.2.7 Sensor and Switch Circuits

(1) The purpose of the home position switch is to move the carriage to a reference position (home position) at the left end of the carriage when the power switch is turned on or when a Reset signal is generated. When the carriage comes to the home position, IP4 (pin (142)) changes from H to L level.

(2) A bottom/rear paper out sensor is provided. When this sensor detects paper out, IP5 (pin (143)) changes from L to H and the LED flashes to indicate paper out status.

(3) A CSF/Friction paper out sensor is provided. When this sensor detects paper out, IP6 (pin (144)) changes from L to H and the LED flashes to indicate paper out status.

(4) If paper feed selector switch is set to the friction position, IP7 (pin (145)) is H and if set to the tractor position, IP7 (pin (145)) is L.


VCC
R300
R301
CN4
6
5
4
PI800
BOTTOM/REAR PE
3
2
1
PI801
FRICTION PE
BOTTOM
FRIC
VCC
RA300
CN3
4
3
2
1
F/T
HOME SWITCH
F/T
HOME
C701
SG
R313
R310
R312
R311
143
144
145
142
IP5
IP6
IP7
IP4
IC6
CA301

8.2.8 Control Panel

The control panel is composed of 7 switches and 13 LEDs.

(1) The ON LINE switch, switches between on-line and off-line and is input to IC6 (pin (92)). This switch is also used to set the Font type while in the function mode.

(2) The paper feed (LF) switch is for one-line paper feed and is input to IC6 (pin (91)). This switch is also used to set the Form Length while in function mode, and for Micro Line Feed while pressing the On Line Switch.

(3) The form feed (FF) switch is for one page-feed and is input to the CPU (pin ④). This switch is also used to set the Pitch while in function mode, and for Micro Line feed while pressing the On Line Switch.

(4) The function switch, switches between function mode and normal operation mode. In the function mode, change of print mode is available.

(5) The power/paper out LED lights when power is turned on and blinks when paper out is detected.

(6) The ON LINE/FUNCTION LED lights when at the on-line status, and blinks while in function mode.

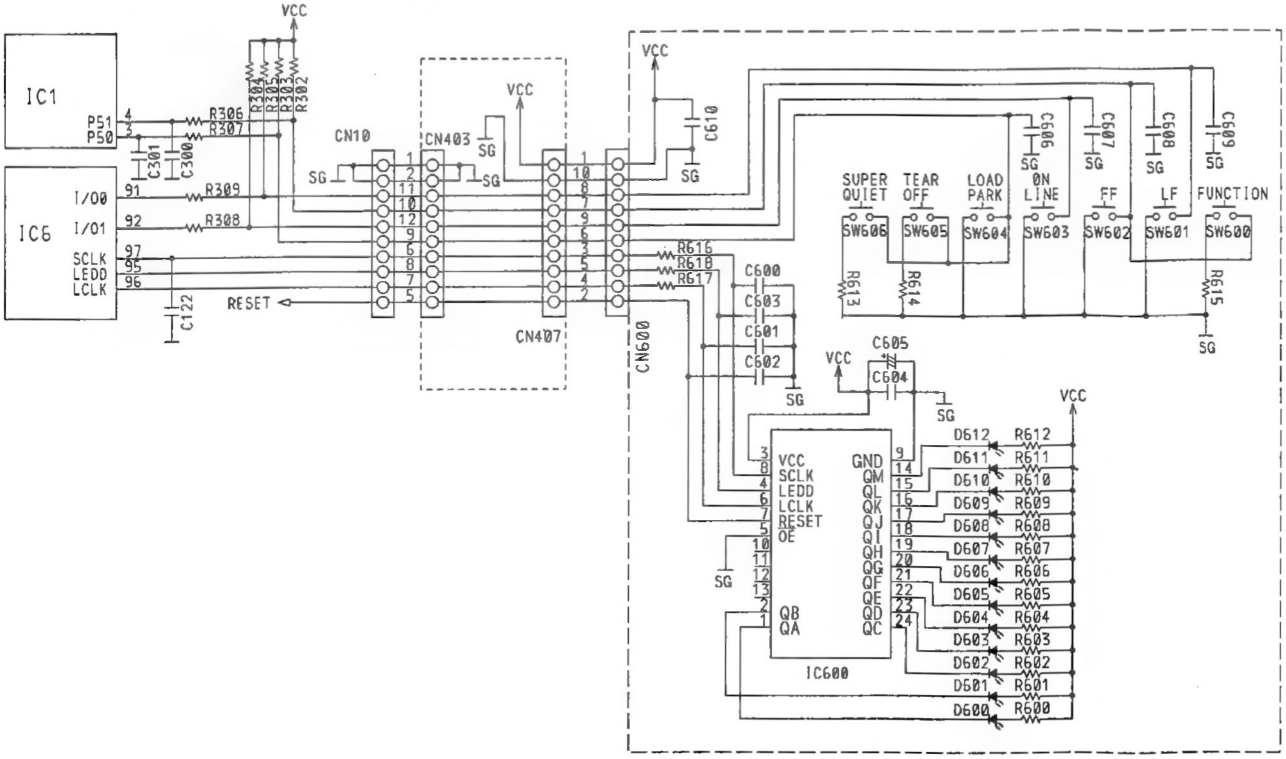
(7) Four ROW LEDs and six COL. LEDs display print mode by matrix.

(8) The SUPER QUIET LED displays Super Quiet Printing mode.

(9) The SUPER QUIET switch enables and disables QUIET mode and is input to the CPU (pin ③). This switch is also used for setting of TOF position.

(10) The TEAR OFF switch enable paper feeding to the tear off position and is input to the CPU (pin③). This switch is also used for selection of various items in FUNCTION mode.

(11) The LOAD PARK switch enables automatic loading and feeding back of the fanfold paper and is input to the CPU (pin③). This switch is also used for mode selection of items.



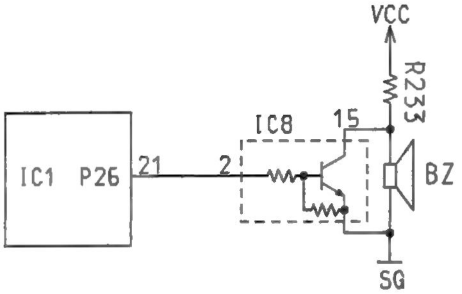
VCC
IC1
P51
P50
R306
R307
R304
R305
R303
R302
C301
C300
IC6
I/00
I/01
SCLK
LEDD
LCLK
91
92
97
95
96
R309
R308
C122
RESET
CN10
CN403
CN407
SG
CN600
C610
C606
C607
C608
C609
SUPER QUIET
TEAR OFF
LOAD PARK
ON LINE
FF
LF
FUNCTION
SW606
SW605
SW604
SW603
SW602
SW601
SW600
R613
R614
R615
R616
R618
R617
C600
C603
C601
C602
C605
C604
IC600
VCC
GND
SCLK
LEDD
LCLK
RESET
OE
QA
QB
QC
QD
QE
QF
QG
QH
QI
QJ
QK
QL
QM
D600
D601
D602
D603
D604
D605
D606
D607
D608
D609
D610
D611
D612
R600
R601
R602
R603
R604
R605
R606
R607
R608
R609
R610
R611
R612

8.2.9 Buzzer, EEPROM

(1) Buzzer

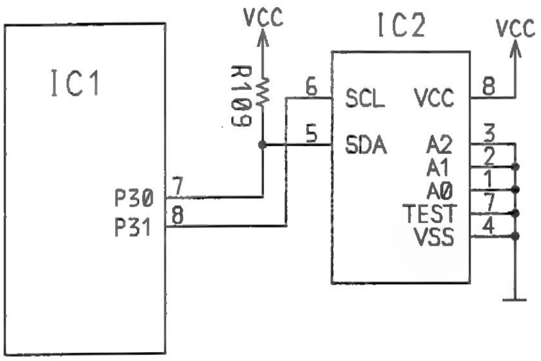
The buzzer is housed inside a case on the logic board, it sounds under the following circumstances:

- Out of paper state ... sounds for 1.0 second.
- Receiving BELL Code ... sounds for 1.0 second.
- Overheat ... sounds for 1.0 second repeatedly until the temperature decreases.
- Incorrect paper path...sounds repeatedly.
- Improper switch is pushed in Function mode...sounds for 0.5 seconds or sounds repeatedly.
- Mode setting acknowledgement...sounds for 0.5 seconds.

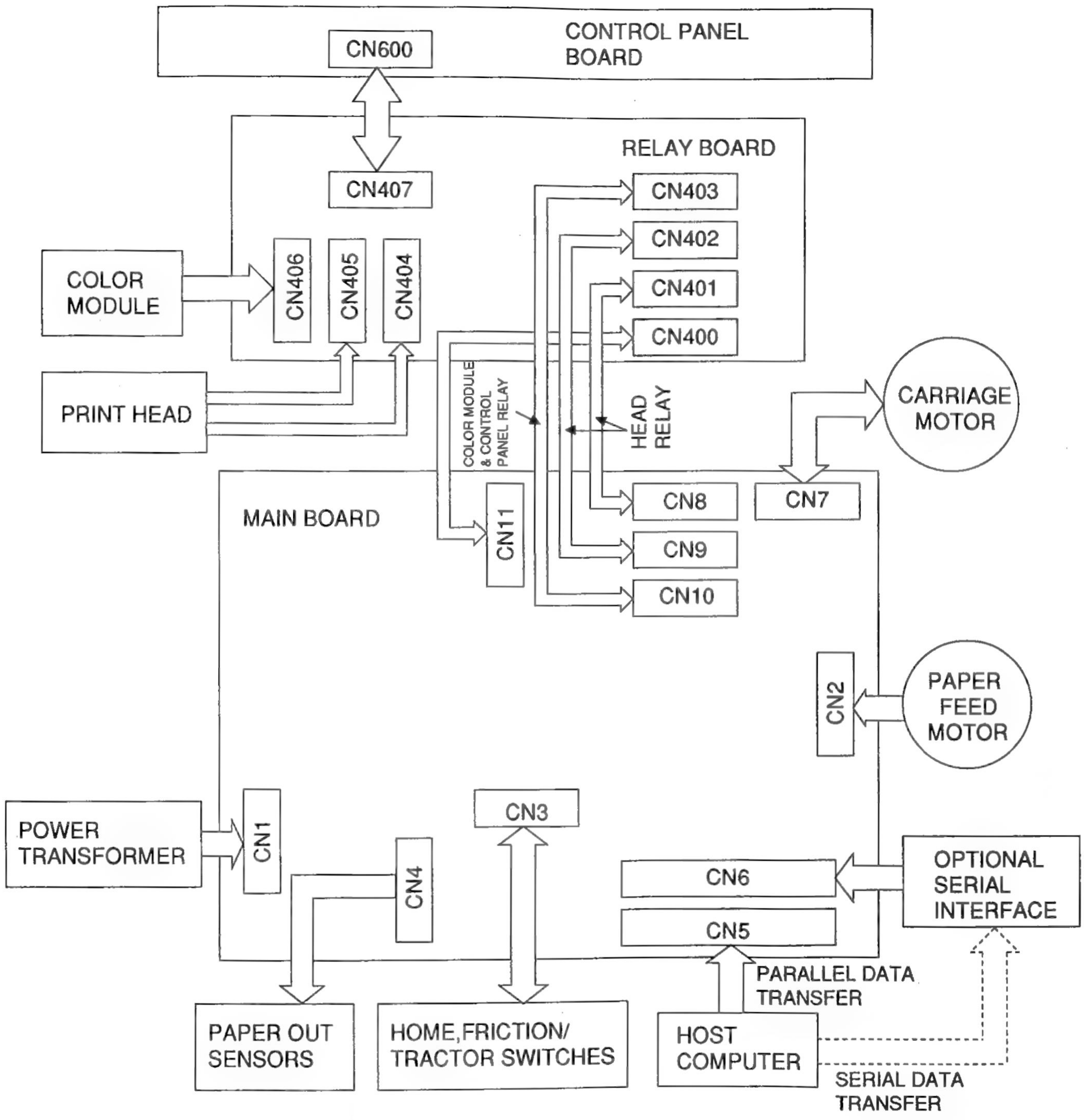

VCC
R233
IC8
15
IC1 P26
21
2
BZ
SG

(2) EEP ROM

This IC memorizes the setting such as printer-mode, character set etc.

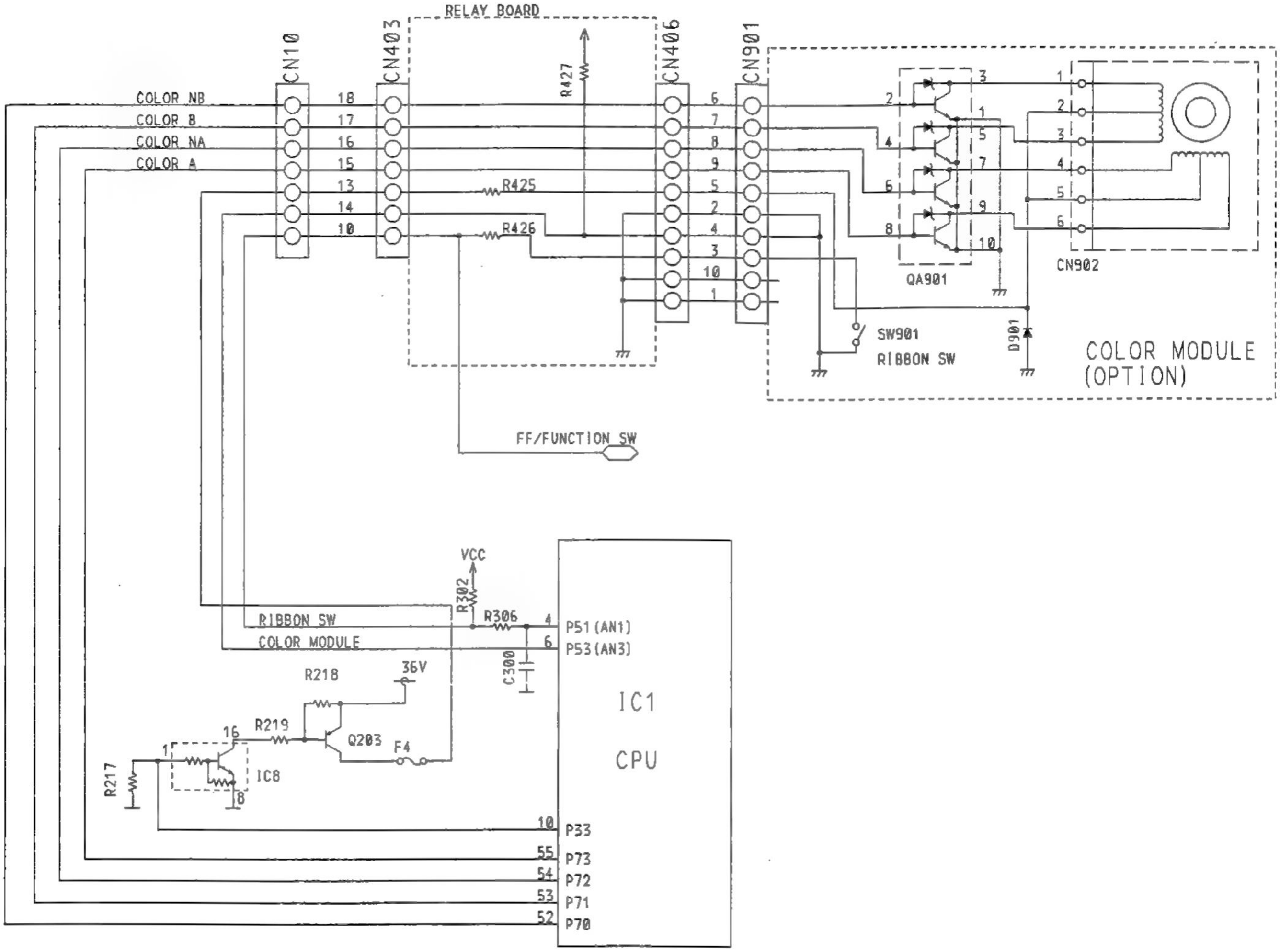

VCC
IC2
VCC
IC1
R109
6
SCL
VCC
8
5
SDA
A2
3
A1
2
A0
1
TEST
7
VSS
4
P30
7
P31
8

8.2.10 Logic Board Connection Diagram


CN600
CONTROL PANEL BOARD
RELAY BOARD
CN407
CN403
CN402
CN401
CN400
COLOR MODULE
CN406
CN405
CN404
PRINT HEAD
COLOR MODULE & CONTROL PANEL RELAY
HEAD RELAY
CARRIAGE MOTOR
MAIN BOARD
CN11
CN8
CN9
CN10
CN7
CN2
PAPER FEED MOTOR
POWER TRANSFORMER
CN1
CN4
CN3
CN6
CN5
OPTIONAL SERIAL INTERFACE
PARALLEL DATA TRANSFER
PAPER OUT SENSORS
HOME,FRICTION/ TRACTOR SWITCHES
HOST COMPUTER
SERIAL DATA TRANSFER

8.2.11 Ribbon Lift Motor Drive Block

Ribbon Lift Motor is driven by 2-2 phase driving system, and the pulse rate is 330 pulses per second. The CPU sets 2-2 phase signals at P70-P73 and they drive QA901 and the motor. At the same time, the CPU sets H level at P33, then IC8 and Q203 are turned on. As a result +28V which stepped down from +36V by resistor R425 is supplied to the motor. When the motor is stopped, P33 is L level and +28V is not supplied to the motor. The CPU detects whether the ribbon is a color or black type by SW901. The CPU also detects whether the Color Module is attached or not attached at P53.


RELAY BOARD
CN10
CN403
CN406
CN901
R427
COLOR NB
COLOR B
COLOR NA
COLOR A
18
17
16
15
13
14
10
R425
R426
6
7
8
9
5
2
4
3
10
1
QA901
CN902
SW901
RIBBON SW
D901
COLOR MODULE
(OPTION)
FF/FUNCTION SW
VCC
R302
R306
RIBBON SW
COLOR MODULE
C300
R218
36V
R219
Q203
F4
IC8
R217
IC1
CPU
P51 (AN1)
P53 (AN3)
P33
P73
P72
P71
P70
4
6
10
55
54
53
52

8.3 Explanation of Connectors

8.3.1 Name of Connectors

Connector applications are shown below. For details, refer to tables.

CN1	: Power Supply	CN8,CN401	: Relay
CN2	: Paper Feed Motor	CN9,CN402	: Relay
CN3	: Home, Friction/Tractor Switches	CN404,CN405	: Printhead
CN4	: Friction, Rear/Bottom Sensors	CN406	: Color Module (Option)
CN5	: Centronics I/O	CN407,CN600	: Control Panel
CN6	: Serial Interface (Option)	CN10,CN403	: Color
CN7	: Carriage Motor	CN11,CN400	: Power Supply (+36V, GND)

8.3.2 Pin Assignment

CN1 (Power Supply)

Pin No.	Signal Name	Description	In/ Out
1	AC 42V	For Main Board	In
2	AC 42V	For Main Board	In
3	———	Not Used	——
4	AC 10V	For Serial Interface Board (Option)	In
5	AC 10V	For Serial Interface Board (Option)	In

CN2 (Paper Feed Motor)

Pin No.	Signal Name	Description	In/ Out
1	LFA	Line Feed Motor Phase A	In
2	SLF	Line Feed Motor Power Supply	Out
3	LFNA	Line Feed Motor Phase $\overline{A}$	In
4	LFB	Line Feed Motor Phase B	In
5	SLF	Line Feed Motor Power Supply	Out
6	LFNB	Line Feed Motor Phase $\overline{B}$	In

CN3 (Home, Friction/Tractor Switches)

Pin No.	Signal Name	Description	In/ Out
1	SG	Signal Ground	Out
2	SW	Home Switch	In
3	SG	Signal Ground	Out
4	SW	Friction/Tractor Switch	In

CN4 (Friction, Rear/Bottom Paper Out Sensors)

Pin No.	Signal Name	Description	In/ Out
1	Cathode	Signal Ground	Out
2	Collector	Friction Paper Out Sensor	In
3	Anode	+5V Supply	Out
4	Cathode	Signal Ground	Out
5	Collector	Rear/Bottom Paper Out Sensor	In
6	Anode	+5V Supply	Out

CN5 (Centronics I/O)

Pin No.	Return Side Pin No.	Signal Name	Description	In/ Out
1	19	$\overline{\text{STB}}$	Strobe	In
2	20	DATA1	Handshake Data 1	In
3	21	DATA2	Handshake Data 2	In
4	22	DATA3	Handshake Data 3	In
5	23	DATA4	Handshake Data 4	In
6	24	DATA5	Handshake Data 5	In
7	25	DATA6	Handshake Data 6	In
8	26	DATA7	Handshake Data 7	In
9	27	DATA8	Handshake Data 8	In
10	28	$\overline{\text{ACK}}$	Acknowledge	Out
11	29	BUSY	Busy	Out
12		PE	Paper End	Out
13		SLCT	Select	Out
14		$\overline{\text{AFXT}}$/1	Auto Feed XT	In
15		———	———	—
16		SG	Signal Ground	—
17		FG	Frame Ground	—
18		+5V	+5V	Out
31	30	$\overline{\text{PRIME}}$	Prime	In
32		$\overline{\text{ERROR}}$	Error	Out
33		———	———	—
34		———	———	—
35		———	———	—
36		———	———	—
19-30		SG	Signal Ground	—

CN6 (Serial Interface (Option))

Pin No.	Signal Name	Description	In/ Out
1	AC10V	AC10V for Serial Option	Out
2	AC10V	Connected to Signal Ground	Out
3	SG	Signal Ground	Out
4	SG	Signal Ground	Out
5	SIF	Check of Option Board	In
6	$\overline{\text{AFXT}}$	$\overline{\text{Auto Feed XT}}$	In
7	SLCT	Select	Out
8	P.E.	Paper End Sensor	Out
9	$\overline{\text{ERROR}}$	$\overline{\text{Error}}$	Out
10	BUSY	Busy	Out
11	$\overline{\text{ACK}}$	$\overline{\text{Acknowledge}}$	Out
12	$\overline{\text{PRIME}}$	$\overline{\text{Prime}}$	In
13	$\overline{\text{STB}}$	$\overline{\text{Strobe}}$	In
14	+5V	+5V Supply	Out
15	+5V	+5V Supply	Out
16	TXD	Transmitted Data	Out
17	DATA8	Handshake Data 8	In
18	DATA7	Handshake Data 7	In
19	DATA6	Handshake Data 6	In
20	DATA5	Handshake Data 5	In
21	DATA4	Handshake Data 4	In
22	DATA3	Handshake Data 3	In
23	DATA2	Handshake Data 2	In
24	DATA1	Handshake Data 1	In
25	RESET	Reset to Option	Out
26	———	———	——
27	RXD	Received Data	In
28	$\overline{\text{DTR}}$	Data Terminal Ready	Out

CN7 (Carriage Motor)

Pin No.	Signal Name	Description	In/ Out
1	CRB	Carriage Motor Phase B	In
2	SCR	Carriage Motor Power Supply	Out
3	CR$\overline{\text{B}}$	Carriage Motor Phase $\overline{\text{B}}$	In
4	CR$\overline{\text{A}}$	Carriage Motor Phase $\overline{\text{A}}$	In
5	SCR	Carriage Motor Power Supply	Out
6	CRA	Carriage Motor Phase A	In

CN11, CN400 (+36V Power Supply)

Pin No.	Signal Name	Description	In/ Out
1	+36V	+36V	——
2	+36V	+36V	——
3	SG	Signal Ground	——
4	SG	Signal Ground	——

CN605(Color Module(Option))

Pin No.	Signal Name	Description	In/ Out
1	SG	Signal Ground	Out
2	AG	Analog Ground	Out
3	RD	Ribbon Detect	In
4	CMD	Color Module Detect	In
5	SRL	Ribbon Lift Motor Power Supply	Out
6	RL$\overline{\text{B}}$	Ribbon Lift Motor Phase $\overline{\text{B}}$	Out
7	RLB	Ribbon Lift Motor Phase B	Out
8	RL$\overline{\text{A}}$	Ribbon Lift Motor Phase $\overline{\text{A}}$	Out
9	RLA	Ribbon Lift Motor Phase A	Out
10	SG	Signal Ground	Out

CN8,CN401 (Relay/Print Head)

Pin No.	Signal Name	Description	In/ Out
1	H19	Head Pin 19 Drive	Out
2	H22	Head Pin 22 Drive	Out
3	H14	Head Pin 14 Drive	Out
4	H6	Head Pin 6 Drive	Out
5	H4	Head Pin 4 Drive	Out
6	H12	Head Pin 12 Drive	Out
7	H20	Head Pin 20 Drive	Out
8	H21	Head Pin 21 Drive	Out
9	HEN	Head Power Enable	Out
10	HEN	Head Power Enable	Out
11	HEN	Head Power Enable	Out
12	HEN	Head Power Enable	Out
13	H8	Head Pin 8 Drive	Out
14	H2	Head Pin 2 Drive	Out
15	H10	Head Pin 10 Drive	Out
16	H16	Head Pin 16 Drive	Out
17	HEN	Head Power Enable	Out
18	HEN	Head Power Enable	Out
19	HEN	Head Power Enable	Out
20	HEN	Head Power Enable	Out

CN407, CN600 (Relay/LED, Switches)

Pin No.	Signal Name	Description	In/ Out
1	+5V	+5V	Out
2	RESET	RESET	Out
3	CKS	Shift Clock In	Out
4	CKL	Latch Clock In	Out
5	CKD	DATA	Out
6	SW	TOF/Others/Set Switches	In
7	SW	FUNCTION/FF/Ribbon Switches	In
8	SW	LF Switch	In
9	SW	On Line Switch	In
10	SG	Signal Ground	Out

CN9,CN402 (Relay/Print Head)

Pin No.	Signal Name	Description	In/ Out
1	PTH	Printhead Overheat Detect	In
2	H24	Head Pin 24 Drive	Out
3	H17	Head Pin 17 Drive	Out
4	H7	Head Pin 7 Drive	Out
5	H1	Head Pin 1 Drive	Out
6	H9	Head Pin 9 Drive	Out
7	H15	Head Pin 15 Drive	Out
8	H23	Head Pin 23 Drive	Out
9	H18	Head Pin 18 Drive	Out
10	HEN	Head Power Enable	Out
11	HEN	Head Power Enable	Out
12	HEN	Head Power Enable	Out
13	HEN	Head Power Enable	Out
14	H11	Head Pin 11 Drive	Out
15	H3	Head Pin 3 Drive	Out
16	H5	Head Pin 5 Drive	Out
17	H13	Head Pin 13 Drive	Out

CN10, CN403 (Relay/LED, Switches, Color Motor)

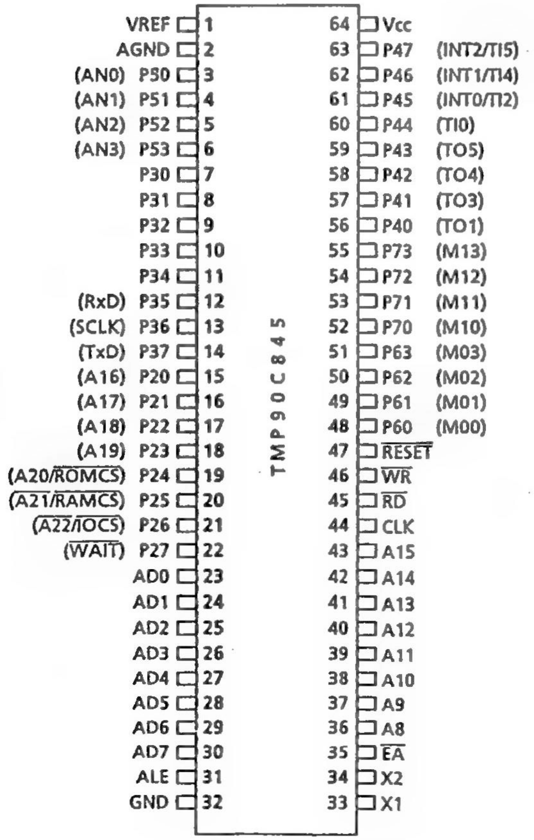
Pin No.	Signal Name	Description	In/ Out
1	SG	Signal Ground	Out
2	SG	Signal Ground	Out
3	+5V	+5V	Out
4	+5V	+5V	Out
5	RESET	RESET	Out
6	CKL	LATCH CLOCK In	Out
7	CKD	DATA	Out
8	CKS	SHIFT CLOCK In	Out
9	SW	TOF/Others/Set Switches	In
10	SW	FUNCTION/FF/Ribbon Switches	In
11	SW	LF Switch	In
12	SW	ON LINE Switch	In
13	+36V	+36V	Out
14	CM	Color Module	In
15	RLA	Ribbon Lift Motor Phase A	Out
16	RL$\overline{A}$	Ribbon Lift Motor Phase $\overline{A}$	Out
17	RLB	Ribbon Lift Motor Phase B	Out
18	RL$\overline{B}$	Ribbon Lift Motor Phase $\overline{B}$	Out

CN404 (Print Head)

Pin No.	Signal Name	Description	In/ Out
1	SG	Signal Ground	Out
2	SG	Signal Ground	Out
3	H2	Head Pin 2 Drive	Out
4	H8	Head Pin 8 Drive	Out
5	H10	Head Pin 10 Drive	Out
6	+36V	+36V for Printhead	Out
7	H16	Head Pin 16 Drive	Out
8	H18	Head Pin 18 Drive	Out
9	+36V	+36V for Printhead	Out
10	+36V	+36V for Printhead	Out
11	H24	Head Pin 24 Drive	Out
12	H23	Head Pin 23 Drive	Out
13	+36V	+36V for Printhead	Out
14	+36V	+36V for Printhead	Out
15	H17	Head Pin 17 Drive	Out
16	H15	Head Pin 15 Drive	Out
17	+36V	+36V for Printhead	Out
18	H9	Head Pin 9 Drive	Out
19	H7	Head Pin 7 Drive	Out
20	H1	Head Pin 1 Drive	Out

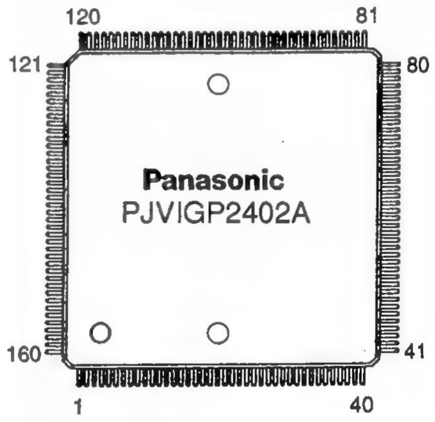
CN405 (Print Head)

Pin No.	Signal Name	Description	In/ Out
21	H4	Head Pin 4 Drive	Out
22	H6	Head Pin 6 Drive	Out
23	H12	Head Pin 12 Drive	Out
24	H14	Head Pin 14 Drive	Out
25	+36V	+36V for Printhead	Out
26	+36V	+36V for Printhead	Out
27	H20	Head Pin 20 Drive	Out
28	H22	Head Pin 22 Drive	Out
29	+36V	+36V for Printhead	Out
30	+36V	+36V for Printhead	Out
31	H21	Head Pin 21 Drive	Out
32	H19	Head Pin 19 Drive	Out
33	+36V	+36V for Printhead	Out
34	+36V	+36V for Printhead	Out
35	H13	Head Pin 13 Drive	Out
36	H11	Head Pin 11 Drive	Out
37	H5	Head Pin 5 Drive	Out
38	H3	Head Pin 3 Drive	Out
39	PTH	Connected to Signal Detect	In
40	PTH	Connected to Signal Ground	Out



VREF 1
AGND 2
(AN0) P50 3
(AN1) P51 4
(AN2) P52 5
(AN3) P53 6
P30 7
P31 8
P32 9
P33 10
P34 11
(RxD) P35 12
(SCLK) P36 13
(TxD) P37 14
(A16) P20 15
(A17) P21 16
(A18) P22 17
(A19) P23 18
(A20/ROMCS) P24 19
(A21/RAMCS) P25 20
(A22/IOCS) P26 21
(WAIT) P27 22
AD0 23
AD1 24
AD2 25
AD3 26
AD4 27
AD5 28
AD6 29
AD7 30
ALE 31
GND 32
TMP90C845
64 Vcc
63 P47 (INT2/TI5)
62 P46 (INT1/TI4)
61 P45 (INT0/TI2)
60 P44 (TI0)
59 P43 (TO5)
58 P42 (TO4)
57 P41 (TO3)
56 P40 (TO1)
55 P73 (M13)
54 P72 (M12)
53 P71 (M11)
52 P70 (M10)
51 P63 (M03)
50 P62 (M02)
49 P61 (M01)
48 P60 (M00)
47 RESET
46 WR
45 RD
44 CLK
43 A15
42 A14
41 A13
40 A12
39 A11
38 A10
37 A9
36 A8
35 EA
34 X2
33 X1

IC1 CPU
TMP90C845

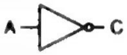
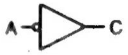
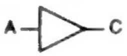
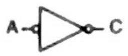
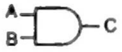
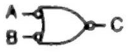


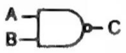
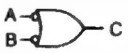
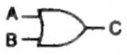
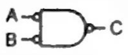
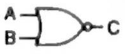
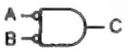
120
81
121
80
Panasonic
PJVIGP2402A
160
41
1
40

IC6 Gate Array
PJVIGP2402A

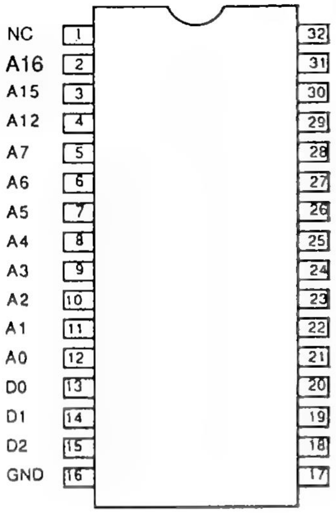
8.4 IC Pin Configuration

8.4.1 Logic Symbol Chart

Positive Logic	Negative Logic	Truth Table
NOT  C = $\overline{A}$	 C = $\overline{A}$	A C L H H L
BUFFER  C = A	 C = A	A C L L H H
AND  C = AB	INVERT-NOR  C = $\overline{\bar{A}+\bar{B}}$	A B C L L L L H L H L L H H H

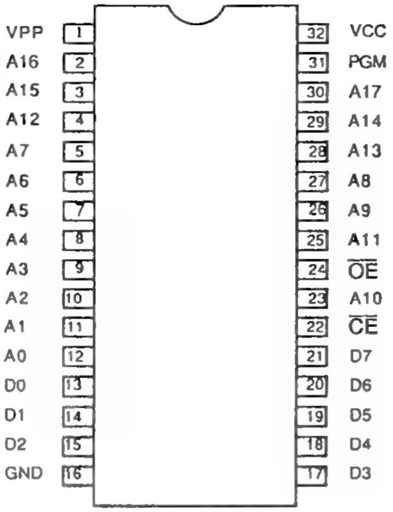
Positive Logic	Negative Logic	Truth Table
NAND  C = $\overline{AB}$	INVERT-OR  C = $\bar{A}+\bar{B}$	A B C L L H L H H H L H H H L
OR  C = A + B	INVERT-NAND  C = $\overline{\bar{A}\bar{B}}$	A B C L L L L H H H L H H H H
NOR  C = $\overline{A+B}$	INVERT-AND  C = $\bar{A}\bar{B}$	A B C L L H L H L H L L H H L

8.4.2 Pin Configuration



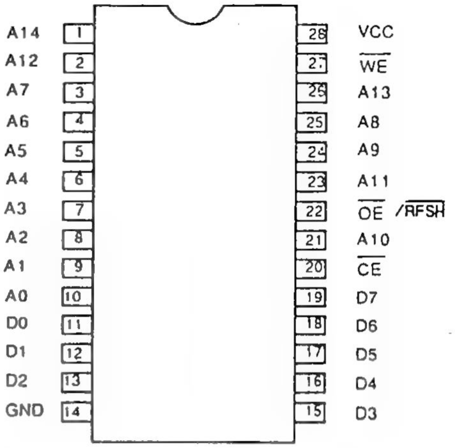
NC 1
A16 2
A15 3
A12 4
A7 5
A6 6
A5 7
A4 8
A3 9
A2 10
A1 11
A0 12
D0 13
D1 14
D2 15
GND 16
32 VCC
31 NC
30 A17
29 A14
28 A13
27 A8
26 A9
25 A11
24 $\overline{\text{OE}}$
23 A10
22 $\overline{\text{CE}}$
21 D7
20 D6
19 D5
18 D4
17 D3

IC3 Mask ROM
2M bit



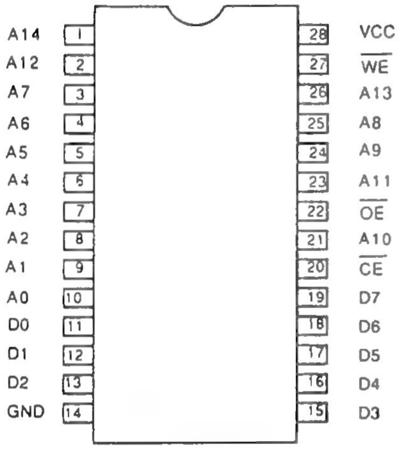
VPP 1
A16 2
A15 3
A12 4
A7 5
A6 6
A5 7
A4 8
A3 9
A2 10
A1 11
A0 12
D0 13
D1 14
D2 15
GND 16
32 VCC
31 PGM
30 A17
29 A14
28 A13
27 A8
26 A9
25 A11
24 $\overline{\text{OE}}$
23 A10
22 $\overline{\text{CE}}$
21 D7
20 D6
19 D5
18 D4
17 D3

IC3 ROM
2M bit (D27C020-150)



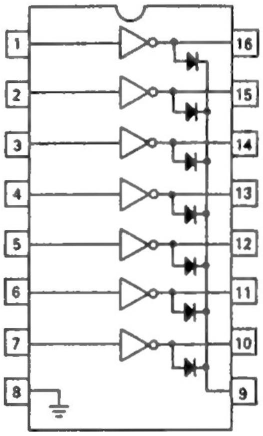
A14 1
A12 2
A7 3
A6 4
A5 5
A4 6
A3 7
A2 8
A1 9
A0 10
D0 11
D1 12
D2 13
GND 14
28 VCC
27 $\overline{\text{WE}}$
26 A13
25 A8
24 A9
23 A11
22 $\overline{\text{OE}}$ /$\overline{\text{RFSH}}$
21 A10
20 $\overline{\text{CE}}$
19 D7
18 D6
17 D5
16 D4
15 D3

IC5 RAM
(TC51832)



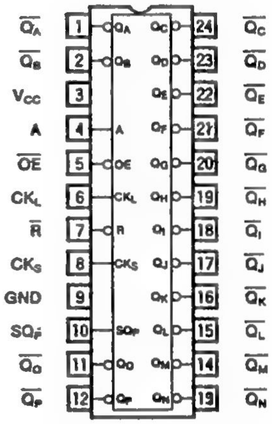
A14 1
A12 2
A7 3
A6 4
A5 5
A4 6
A3 7
A2 8
A1 9
A0 10
D0 11
D1 12
D2 13
GND 14
28 VCC
27 $\overline{\text{WE}}$
26 A13
25 A8
24 A9
23 A11
22 $\overline{\text{OE}}$
21 A10
20 $\overline{\text{CE}}$
19 D7
18 D6
17 D5
16 D4
15 D3

IC4
(MB84256)
Option



1
2
3
4
5
6
7
8
16
15
14
13
12
11
10
9

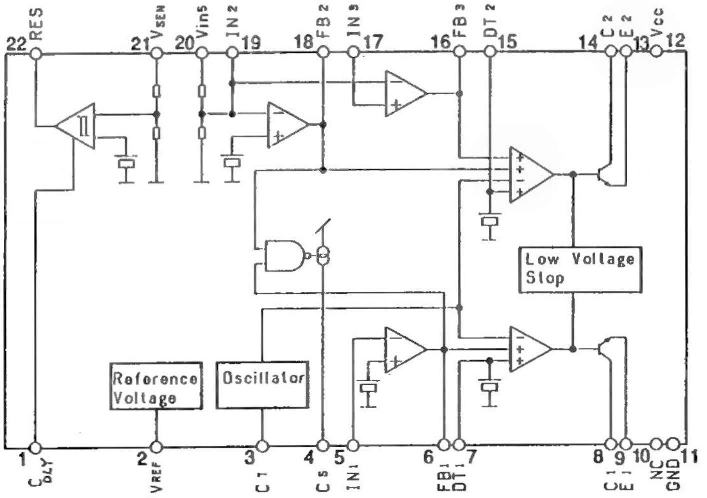
IC7,8
(MC1413)



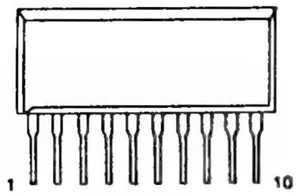
$\overline{Q_A}$ 1
$\overline{Q_B}$ 2
V_{CC} 3
A 4
$\overline{\text{OE}}$ 5
CK_L 6
$\overline{R}$ 7
CK_S 8
GND 9
SQ_F 10
$\overline{Q_O}$ 11
$\overline{Q_P}$ 12
24 $\overline{Q_C}$
23 $\overline{Q_D}$
22 $\overline{Q_E}$
21 $\overline{Q_F}$
20 $\overline{Q_G}$
19 $\overline{Q_H}$
18 $\overline{Q_I}$
17 $\overline{Q_J}$
16 $\overline{Q_K}$
15 $\overline{Q_L}$
14 $\overline{Q_M}$
13 $\overline{Q_N}$
Q_A
Q_B
A
OE
CK_L
R
CK_S
SQ_F
Q_O
Q_P
Q_C
Q_D
Q_E
Q_F
Q_G
Q_H
Q_I
Q_J
Q_K
Q_L
Q_M
Q_N

IC600
(M66311)

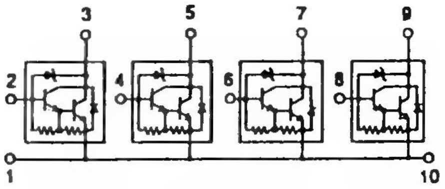
IC9 (AN8081NK)



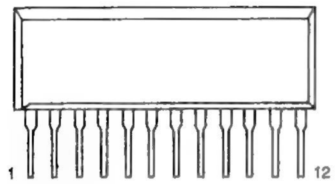
22 RES
21 V_{SEN}
20 Vin5
IN 2 19
18 FB 2
IN 3 17
16 FB 3
DT 2 15
14 C 2
E 2 13
Vcc 12
Low Voltage Stop
Reference Voltage
Oscillator
1 C_{DLY}
2 V_{REF}
3 C T
4 C S
5 IN 1
6 FB 1
7 DT 1
8 C 1
9 E 1
10 NC
11 GND



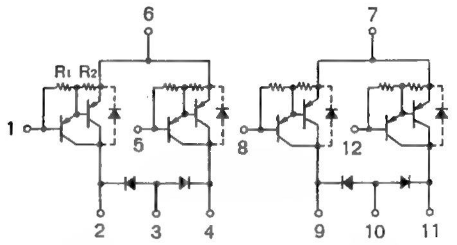
QA400-405
(MP4102)


3
5
7
9
2
4
6
8
1
10

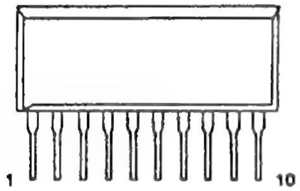
Printhead Driver



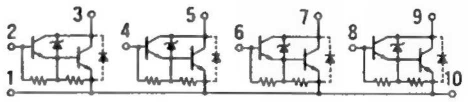
QA406-408
(MP4305)


6
7
R1 R2
1
5
8
12
2
3
4
9
10
11

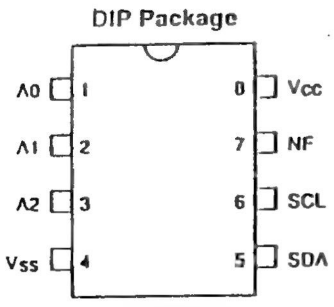
Printhead Driver



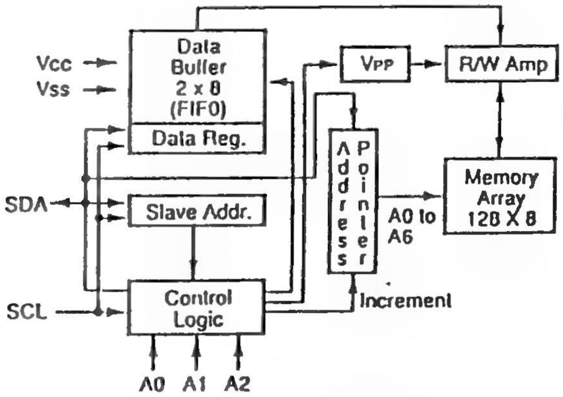
QA200
(STA401A)


3
5
7
9
2
4
6
8
1
10

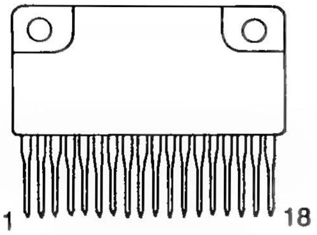
Line Feed Motor Driver

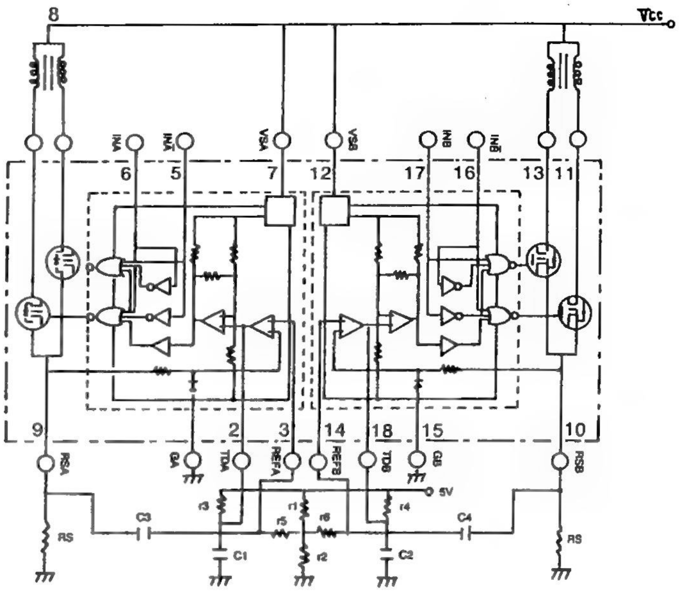

DIP Package
A0 1
A1 2
A2 3
Vss 4
8 Vcc
7 NF
6 SCL
5 SDA

IC2
(24C01A-P)


Vcc
Vss
Data Buffer 2 x 8 (FIFO)
Data Reg.
Vpp
R/W Amp
SDA
Slave Addr.
Address Pointer
A0 to A6
Memory Array 128 X 8
SCL
Control Logic
Increment
A0
A1
A2

BLOCK DIAGRAM




8
Vcc
INA
INĀ
VSA
VSB
INB
INB̄
6
5
7
12
17
16
13
11
9
2
3
14
18
15
10
RSA
GA
TDA
REFA
REFB
TDB
GB
RSB
5V
r1
r2
r3
r4
r5
r6
C1
C2
C3
C4
RS
RS

QA201
(SLA7024M)

Carriage Spacing Motor Driver

8.4.3 Pin Assignment

IC1 CPU (TMP90C845N)

Pin No.	Symbol	Function	In/ Out
1	VREF	+5V	In
2	AGND	GND	In
3	AN0	SUPER QUIET/TEAR OFF/LOAD PARK	In
4	AN1	FF/FUNCTION	In
5	AN2	Over heat Protector	In
6	AN3	Color Module Detector	In
7	P30	EEPROM Data IN/OUT	In/Out
8	P31	EEPROM Clock	Out
9	P32	Not Used	—
10	P33	Color Motor Enable	Out
11	P34	Serial DTR	Out
12	RXD	Serial Received Data	In
13	P36	Not Used	—
14	TXD	Serial Transmit Data	Out
15	A16	Address Bus 16	Out
16	A17	Address Bus 17	Out
17	A18	Address Bus 18	Out
18	A19	Address Bus 19	Out
19	A20	Address Bus 20	Out
20	A21	Not Used	—
21	P26	Buzzer	Out
22	P27	Not Used	—
23	AD0	Address Bus 0	In/Out
24	AD1	Address Bus 1	In/Out
25	AD2	Address Bus 2	In/Out
26	AD3	Address Bus 3	In/Out
27	AD4	Address Bus 4	In/Out
28	AD5	Address Bus 5	In/Out
29	AD6	Address Bus 6	In/Out
30	AD7	Address Bus 7	In/Out
31	ALE	Address Latch Enable	Out
32	GND	GND	In

Pin No.	Symbol	Function	In/ Out
33	X1	OSC In	In
34	X2	OSC Out	Out
35	EA	Extend Address (GND)	In
36	A8	Address Bus 8	Out
37	A9	Address Bus 9	Out
38	A10	Address Bus 10	Out
39	A11	Address Bus 11	Out
40	A12	Address Bus 12	Out
41	A13	Address Bus 13	Out
42	A14	Address Bus 14	Out
43	A15	Address Bus 15	Out
44	CLK	System Clock	Out
45	RD	Read Enable	Out
46	WR	Write Enable	Out
47	RESET	Reset In	In
48	MO0	Not Used	—
49	MO1	Not Used	—
50	MO2	Not Used	—
51	MO3	Not Used	—
52	M10	Color NB	Out
53	M11	Color B	Out
54	M12	Color NA	Out
55	M13	Color A	Out
56	TO1	CR Trigger Out	Out
57	TO3	Timer 3 Out	Out
58	TO4	Even Head PIN Trigger	Out
59	TO5	Odd Head PIN Trigger	Out
60	TI0	Timer 1 In	In
61	INT0	Interrupt 0 In	In
62	T14	Timer 4 In	In
63	INT2	Interrupt 2 In	In
64	VCC	+5V	In

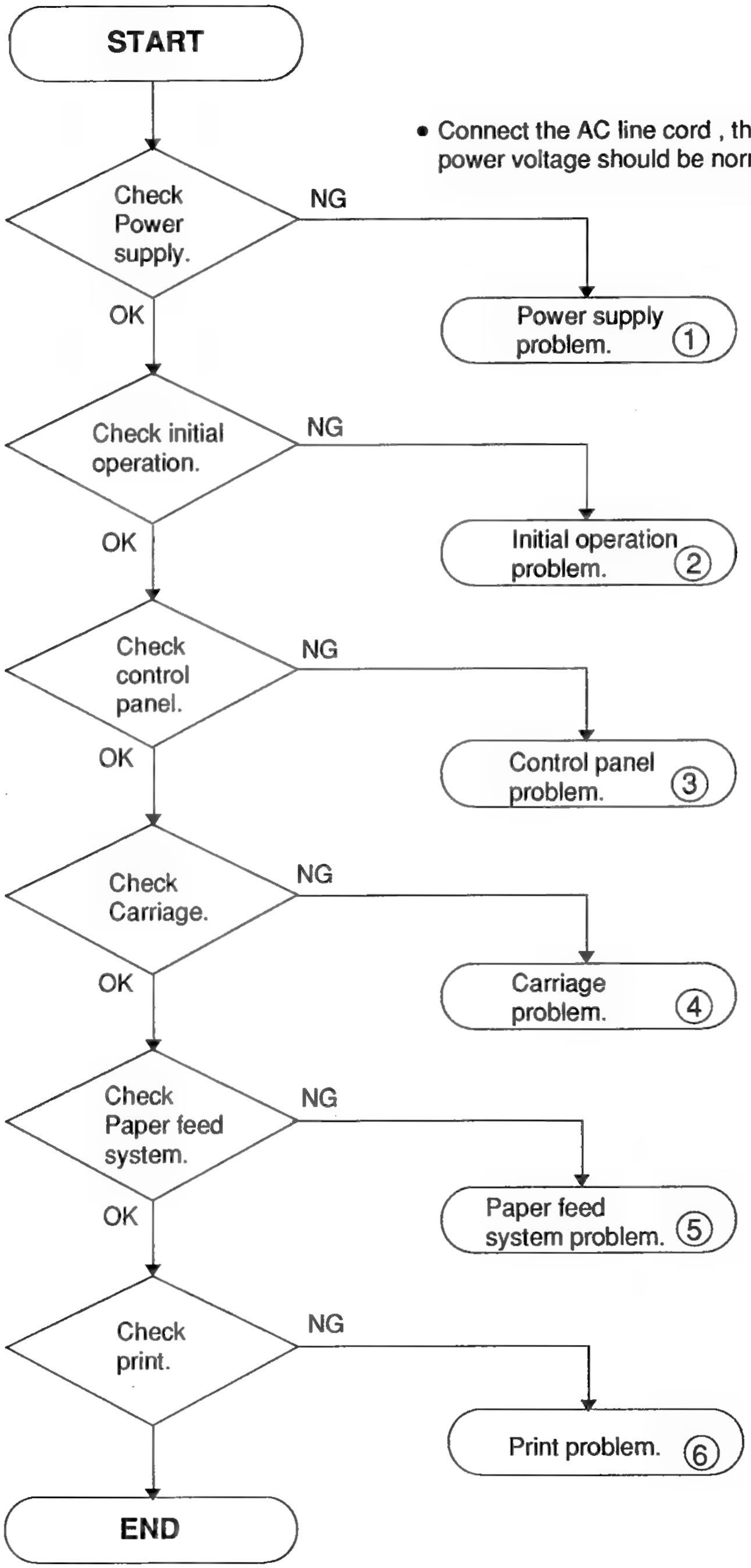
Pin No.	Symbol	Function	In/ Out
1	VCC	+5V	In
2	A7	Address Bus A7	In
3	A8	Address Bus A8	In
4	A6	Address Bus A6	In
5	A9	Address Bus A9	In
6	A5	Address Bus A5	In
7	A11	Address Bus A11	In
8	A4	Address Bus A4	In
9	RD	Read Enable	In
10	A3	Address Bus A3	In
11	A10	Address Bus A10	In
12	A2	Address Bus A2	In
13	A1	Address Bus A1	In
14	AD7	Address Data Bus 7	In/Out
15	A0	Address Bus A0	In
16	AD6	Address Data Bus 6	In/Out
17	AD0	Address Data Bus 0	In/Out
18	AD5	Address Data Bus 5	In/Out
19	GND	Ground	In
20	VCC	+5V	In
21	GND	Ground	In
22	AD1	Address Data Bus 1	In/Out
23	AD4	Address Data Bus 4	In/Out
24	AD2	Address Data Bus 2	In/Out
25	AD3	Address Data Bus 3	In/Out
26	ROM1	ROM1 Chip Enable	Out
27	RFSH	Not Used	—
28	RAM2	RAM2 Chip Enable	Out
29	RAM1	RAM1 Chip Enable	Out
30	ROM2	Not Used	—
31	ALE	Address Latch Enable	In
32	WR	Write Enable	In
33	CLK	System clock	In
34	CRTRG	Carriage Trigger	In
35	EHTRG	Even Head PIN Trigger	In
36	OHTRG	Odd Head PIN Trigger	In
37	INT0	Interrupt Request 0	Out
38	INT2	Interrupt Request 2	Out
39	RESET	RESET	In
40	VCC	+5V	In

Pin No.	Symbol	Function	In/ Out
41	GND	Ground	In
42	GND	Ground	In
43	HDCO6	Head Common Odd 6	Out
44	HDCE3	Head Common Even 3	Out
45	HDCE2	Head Common Even 2	Out
46	HDCE6	Head Common Even 6	Out
47	HDCO2	Head Common Odd 2	Out
48	HDCO3	Head Common Odd 3	Out
49	HDCO5	Head Common Odd 5	Out
50	HDCO1	Head Common Odd 1	Out
51	HDCE4	Head Common Even 4	Out
52	HDCE1	Head Common Even 1	Out
53	HDCE5	Head Common Even 5	Out
54	HDCO4	Head Common Odd 4	Out
55	H15	Head Pin 15	Out
56	H9	Head Pin 9	Out
57	H1	Head Pin 1	Out
58	H7	Head Pin 7	Out
59	H22	Head Pin 22	Out
60	H19	Head Pin 19	Out
61	GND	Ground	In
62	H11	Head Pin 11	Out
63	H3	Head Pin 3	Out
64	H5	Head Pin 5	Out
65	H13	Head Pin 13	Out
66	H21	Head Pin 21	Out
67	H20	Head Pin 20	Out
68	H14	Head Pin 14	Out
69	H6	Head Pin 6	Out
70	H4	Head Pin 4	Out
71	H12	Head Pin 12	Out
72	H17	Head Pin 17	Out
73	H24	Head Pin24	Out
74	H16	Head Pin 16	Out
75	H10	Head Pin 10	Out
76	H2	Head Pin 2	Out
77	H8	Head Pin 8	Out
78	H18	Head Pin 18	Out
79	GND	Ground	In
80	GND	Ground	In

Pin No.	Symbol	Function	In/ Out
81	Vcc	+5V	In
82	H23	Head Pin 23	Out
83	LCDPW	Not Used	Out
84	LCDD3	Not Used	Out
85	LCDD2	Not Used	Out
86	LCDD1	Not Used	Out
87	LCDD0	Not Used	Out
88	LCDE	Not Used	Out
89	LCDR/W	Not Used	Out
90	LCDRS	Not Used	Out
91	I/O0	LF Switch	In
92	I/O1	ON LINE Switch	In
93	GND	Ground	In
94	GND	Ground	In
95	LEDD	LED Data	Out
96	LCLK	LED Latch Clock	Out
97	SCLK	LED Shift Clock	Out
98	(I/O4)	Ground	In
99	GND	Ground	In
100	Vcc	+5V	In
101	GND	Ground	In
102	(IP0)	Ground	In
103	(IP1)	Not Used	—
104	CRCNT2	CR Power Control 2	Out
105	CRCNT1	CR Power Control 1	Out
106	CRE	Carriage Enable	Out
107	CRA	CR Motor A	Out
108	CRNA	CR Motor $\overline{A}$	Out
109	CRNB	CR Motor $\overline{B}$	Out
110	CRB	CR Motor B	Out
111	LFE	LF Enable	Out
112	LFA	LF Motor A	Out
113	LFNA	LF Motor $\overline{A}$	Out
114	LFB	LF Motor B	Out
115	LFNB	LF Motor $\overline{B}$	Out
116	HS0	Centronics Data 0	In
117	HS1	Centronics Data 1	In
118	HS2	Centronics Data 2	In
119	HS3	Centronics Data 3	In
120	Vcc	+5V	In

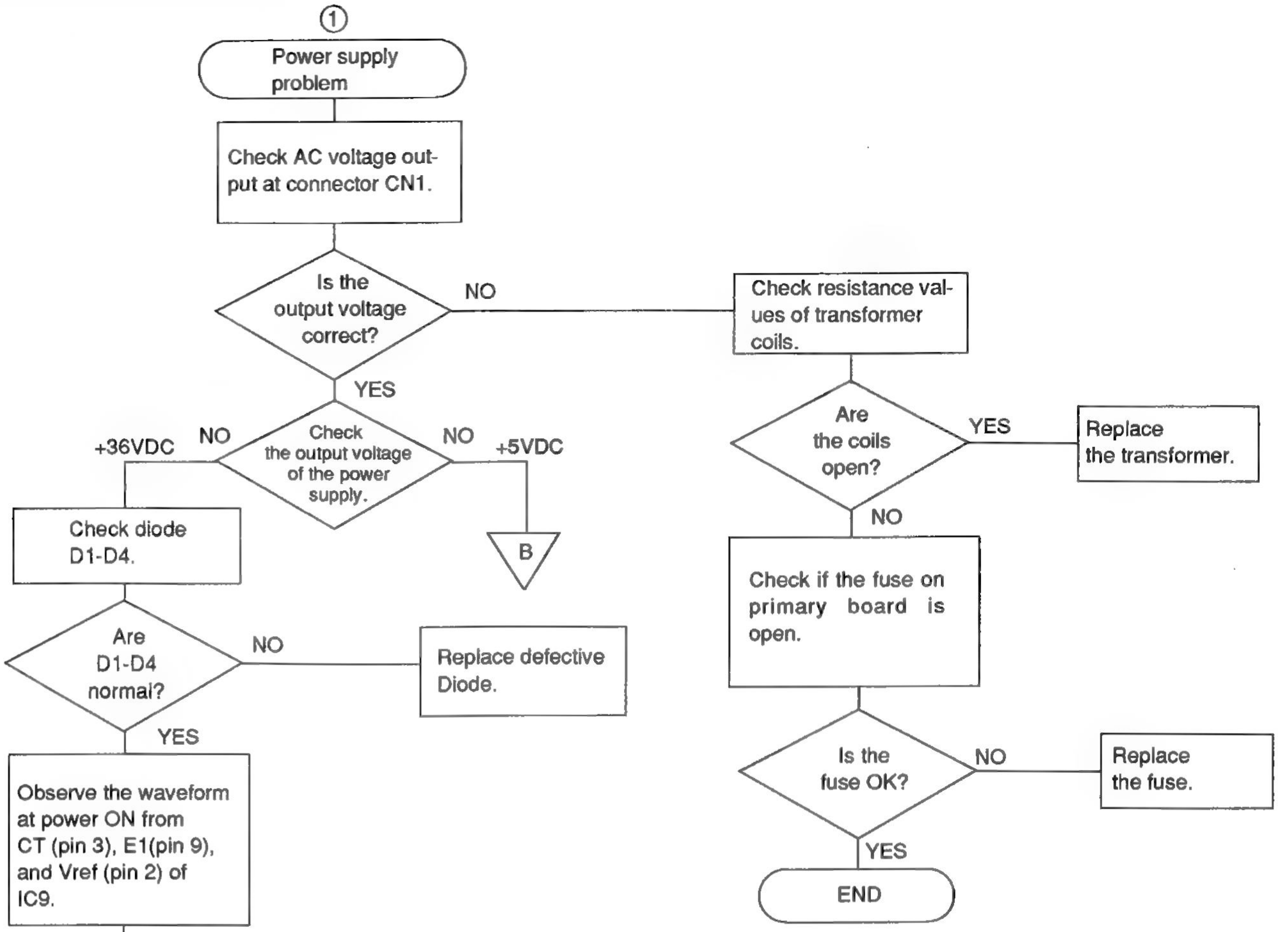
Pin No.	Symbol	Function	In/ Out
121	GND	Ground	In
122	GND	Ground	In
123	HS4	Centronics Data 4	In
124	HS5	Centronics Data 5	In
125	HS6	Centronics Data 6	In
126	HS7	Centronics Data 7	In
127	STB	STB from Host	In
128	PRIME	$\overline{\text{Prime}}$	In
129	GND	$\overline{\text{Ground}}$	In
130	ACK	$\overline{\text{ACK to Host}}$	Out
131	BUSY	Busy to Host	Out
132	ERROR	$\overline{\text{ERROR}}$	Out
133	P.E.	PE	Out
134	SELECT	SELECT	Out
135	AFXT	$\overline{\text{AFXT}}$	In
136	I/O5	Serial SIF	In
137	RINF3	Not Used	—
138	RINF2	Not Used	—
139	EXPRM	Not Used	—
140	(IP2)	Ground	In
141	(IP3)	Ground	In
142	IP4	Carriage Home Sensor	In
143	IP5	Bottom/Rear Paper end Sensor	In
144	IP6	Rear Paper End Sensor	In
145	IP7	Paper Feed Selection Sensor	In
146	A21	Address Bus A21	In
147	A20	Address Bus A20	In
148	A19	Address Bus A19	In
149	A18	Address Bus A18	In
150	GA19	Not Used	—
151	GA18A	Not Used	—
152	GA18B	Not Used	—
153	A16	Address Bus A16	In
154	A17	Address Bus A17	In
155	A15	Address Bus A15	In
156	A14	Address Bus A14	In
157	A12	Address Bus A12	In
158	A13	Address Bus A13	In
159	GND	Ground	In
160	GND	Ground	In

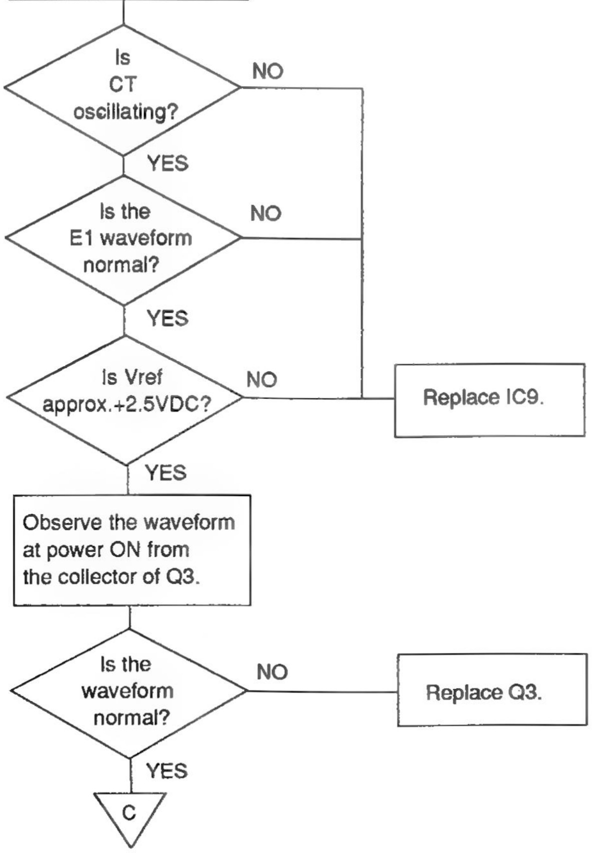
8.5 Trouble Shooting Flow Chart

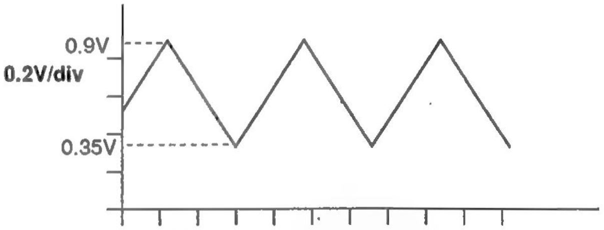


- Connect the AC line cord , the power voltage should be normal.

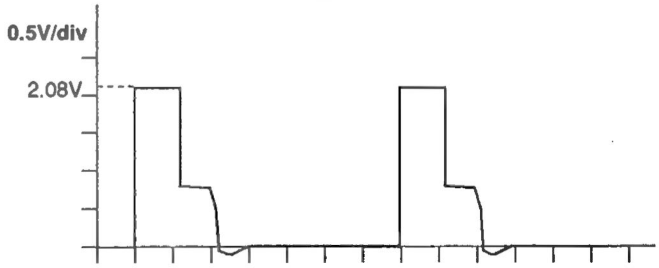
START
Check Power supply.
NG
Power supply problem. ①
OK
Check initial operation.
NG
Initial operation problem. ②
OK
Check control panel.
NG
Control panel problem. ③
OK
Check Carriage.
NG
Carriage problem. ④
OK
Check Paper feed system.
NG
Paper feed system problem. ⑤
OK
Check print.
NG
Print problem. ⑥
END


①
Power supply problem
Check AC voltage output at connector CN1.
Is the output voltage correct?
NO
Check resistance values of transformer coils.
YES
Are the coils open?
YES
Replace the transformer.
NO
Check if the fuse on primary board is open.
Is the fuse OK?
NO
Replace the fuse.
YES
END
Check the output voltage of the power supply.
+36VDC
NO
NO
+5VDC
B
Check diode D1-D4.
Are D1-D4 normal?
NO
Replace defective Diode.
YES
Observe the waveform at power ON from CT (pin 3), E1(pin 9), and Vref (pin 2) of IC9.

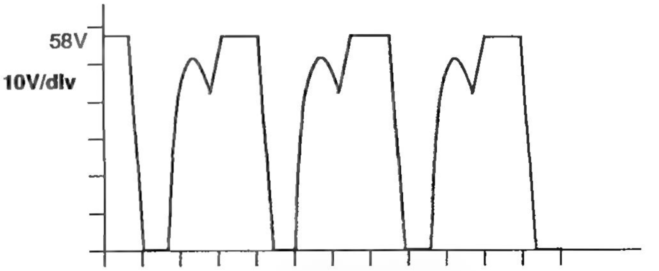

Is CT oscillating?
NO
YES
Is the E1 waveform normal?
NO
YES
Is Vref approx.+2.5VDC?
NO
Replace IC9.
YES
Observe the waveform at power ON from the collector of Q3.
Is the waveform normal?
NO
Replace Q3.
YES
C



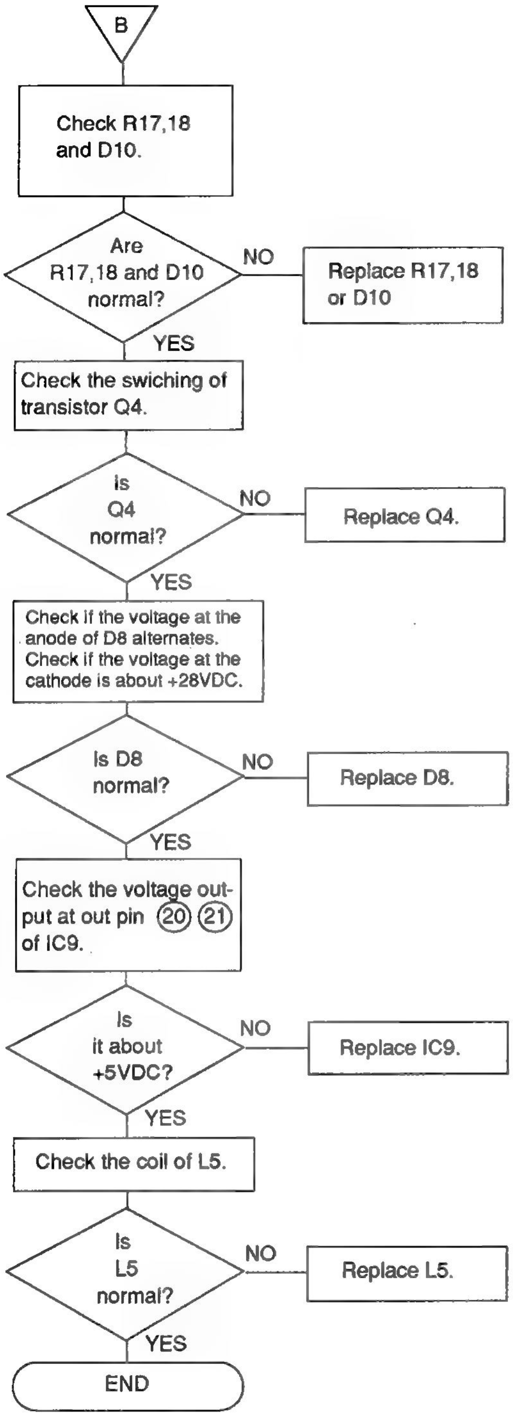
IC9 ③ Voltage Waveform **10 μ sec/div**

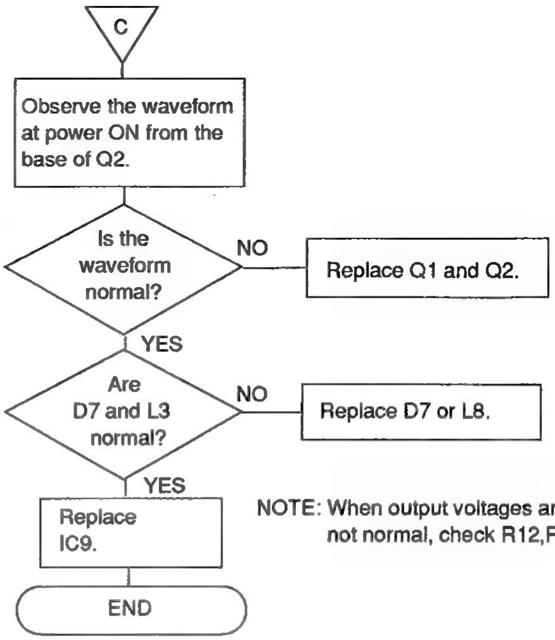


IC9 ⑨ Voltage Waveform **5 μ sec/div**

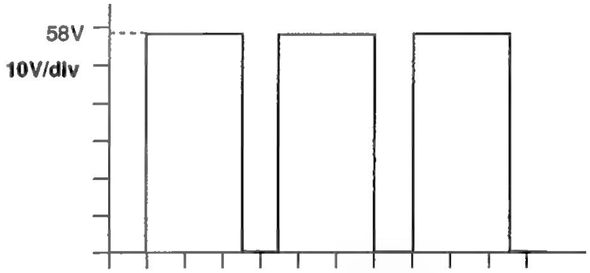


Q3 Collector Voltage Waveform **10 μ sec/div**

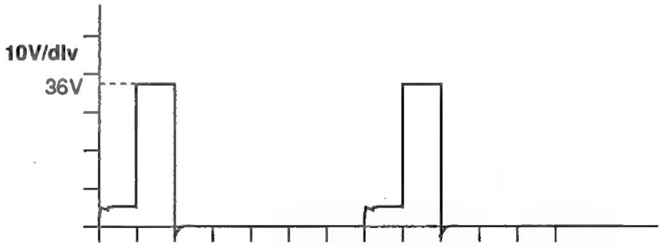

B
Check R17,18 and D10.
Are R17,18 and D10 normal?
NO
Replace R17,18 or D10
YES
Check the swiching of transistor Q4.
Is Q4 normal?
NO
Replace Q4.
YES
Check if the voltage at the anode of D8 alternates. Check if the voltage at the cathode is about +28VDC.
Is D8 normal?
NO
Replace D8.
YES
Check the voltage output at out pin ⑳ ㉑ of IC9.
Is it about +5VDC?
NO
Replace IC9.
YES
Check the coil of L5.
Is L5 normal?
NO
Replace L5.
YES
END


C
Observe the waveform at power ON from the base of Q2.
Is the waveform normal?
NO
Replace Q1 and Q2.
YES
Are D7 and L3 normal?
NO
Replace D7 or L8.
YES
Replace IC9.
END

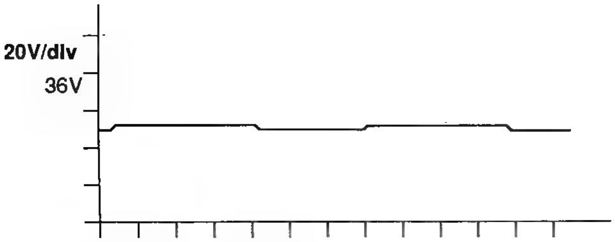
NOTE: When output voltages are not normal, check R12,R13.



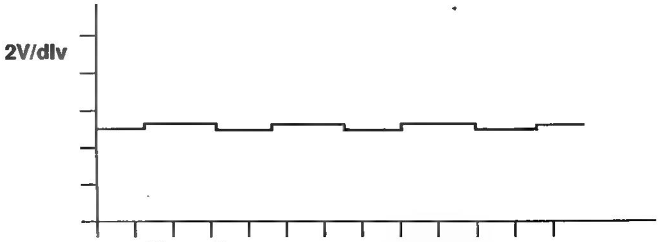
Q1 Emitter Voltage Waveform



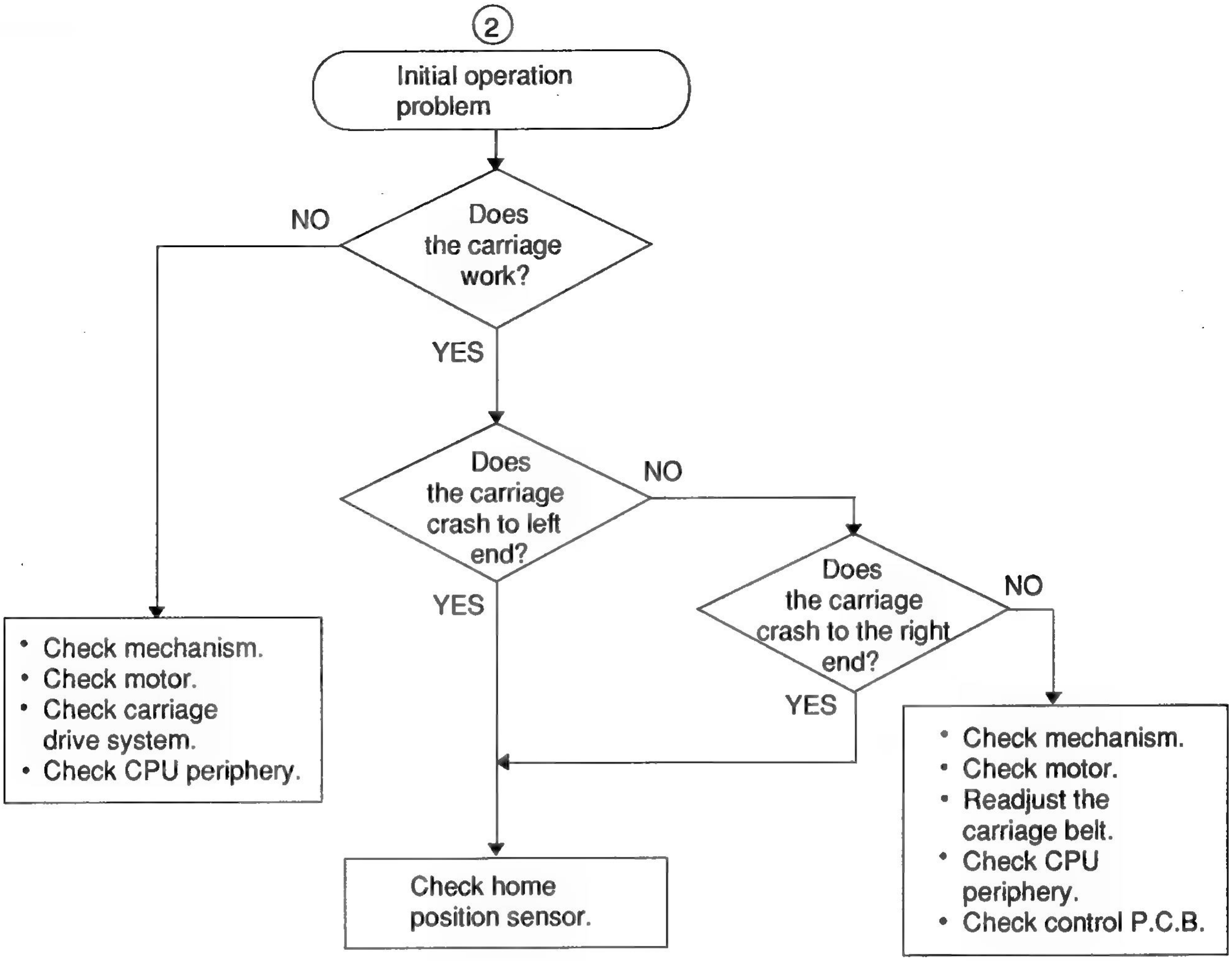
Q4 Collector Voltage Waveform

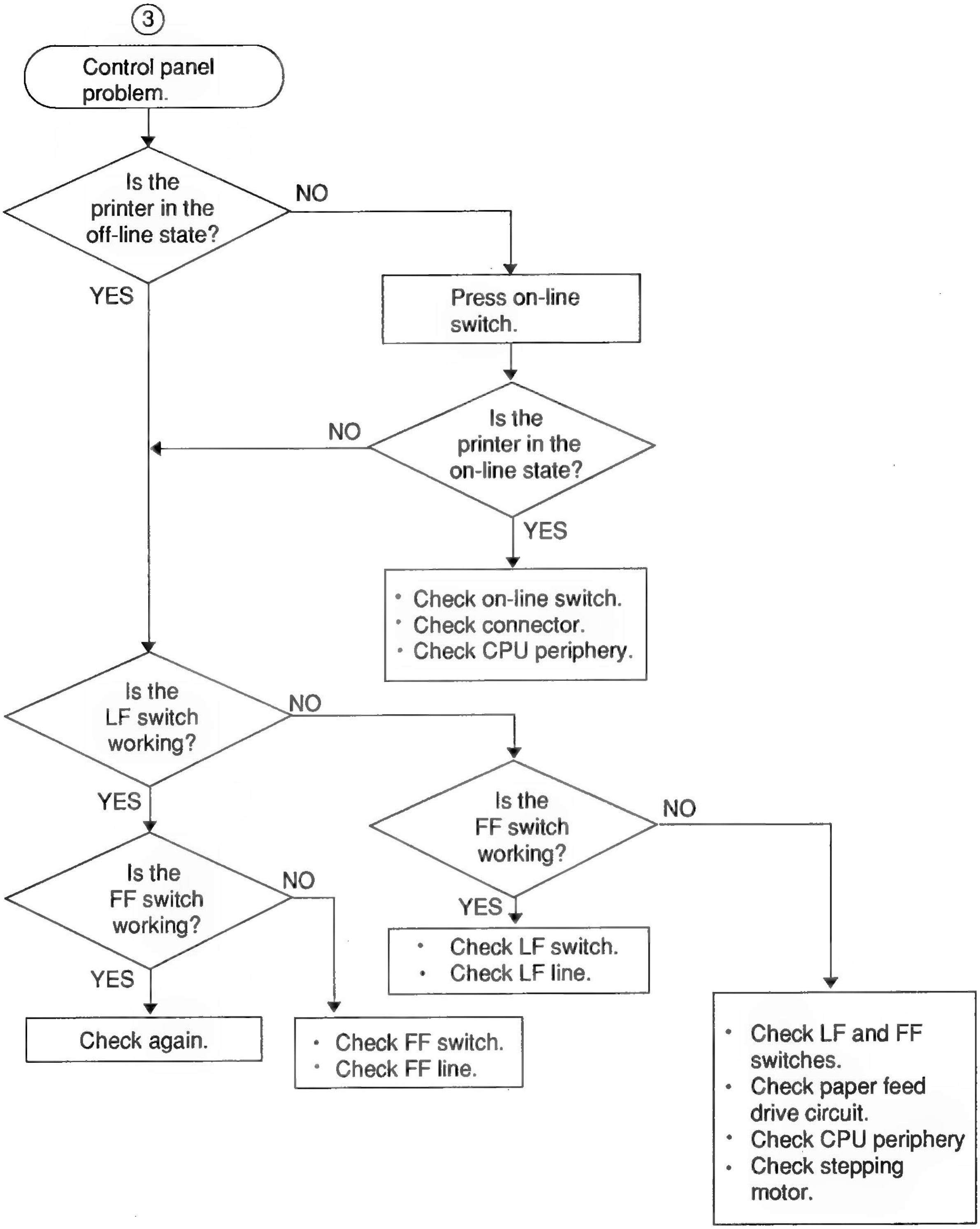


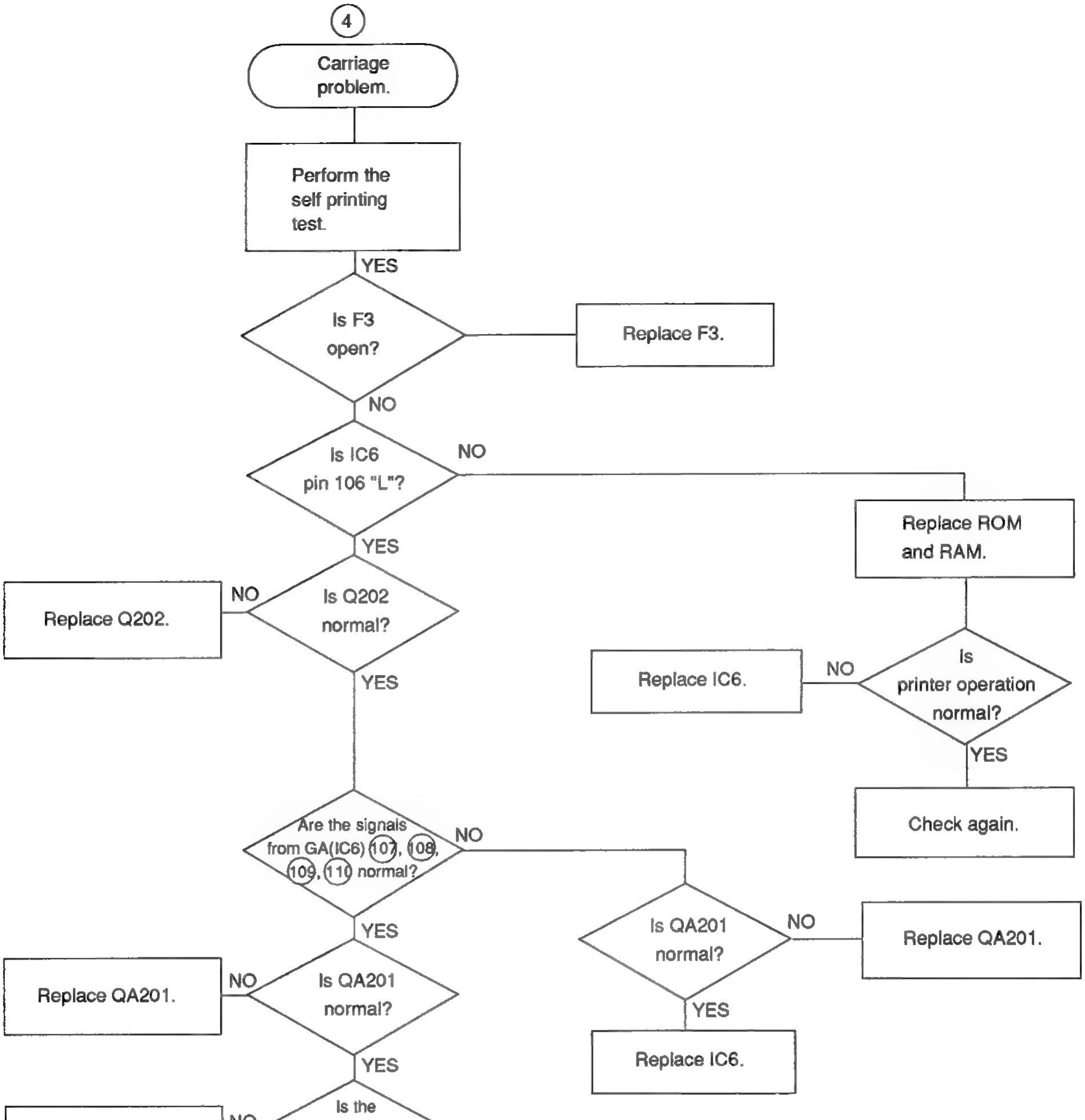
Q2 Base Voltage Waveform

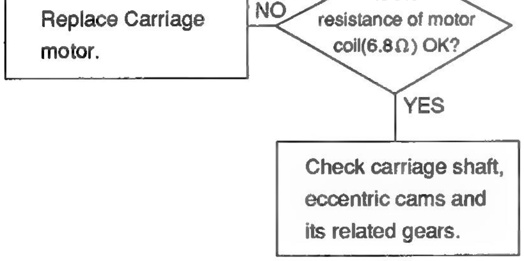


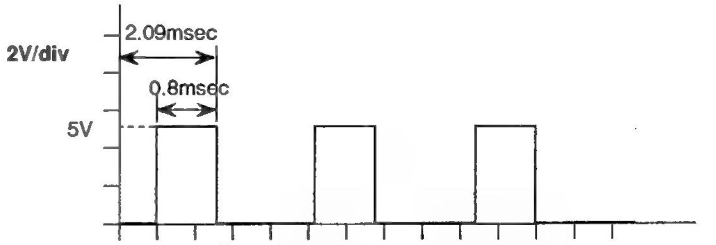
IC9 ⑳ , ㉑ Voltege Waveform


2
Initial operation problem
Does the carriage work?
NO
YES
• Check mechanism.
• Check motor.
• Check carriage drive system.
• Check CPU periphery.
Does the carriage crash to left end?
NO
YES
Does the carriage crash to the right end?
NO
YES
• Check mechanism.
• Check motor.
• Readjust the carriage belt.
• Check CPU periphery.
• Check control P.C.B.
Check home position sensor.

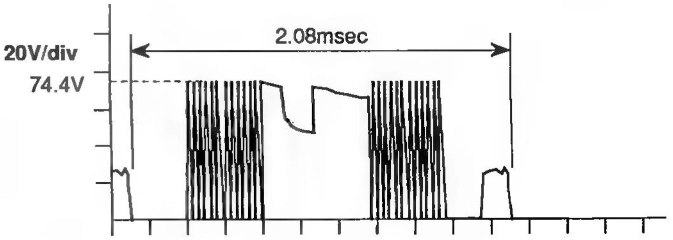

③
Control panel problem.
Is the printer in the off-line state?
NO
YES
Press on-line switch.
Is the printer in the on-line state?
NO
YES
• Check on-line switch.
• Check connector.
• Check CPU periphery.
Is the LF switch working?
NO
YES
Is the FF switch working?
NO
YES
Is the FF switch working?
NO
YES
• Check LF switch.
• Check LF line.
Check again.
• Check FF switch.
• Check FF line.
• Check LF and FF switches.
• Check paper feed drive circuit.
• Check CPU periphery
• Check stepping motor.


4
Carriage problem.
Perform the self printing test.
YES
Is F3 open?
Replace F3.
NO
Is IC6 pin 106 "L"?
NO
Replace ROM and RAM.
YES
Is Q202 normal?
NO
Replace Q202.
YES
Is printer operation normal?
NO
Replace IC6.
YES
Check again.
Are the signals from GA(IC6) 107, 108, 109, 110 normal?
NO
Is QA201 normal?
NO
Replace QA201.
YES
Replace IC6.
YES
Is QA201 normal?
NO
Replace QA201.
YES

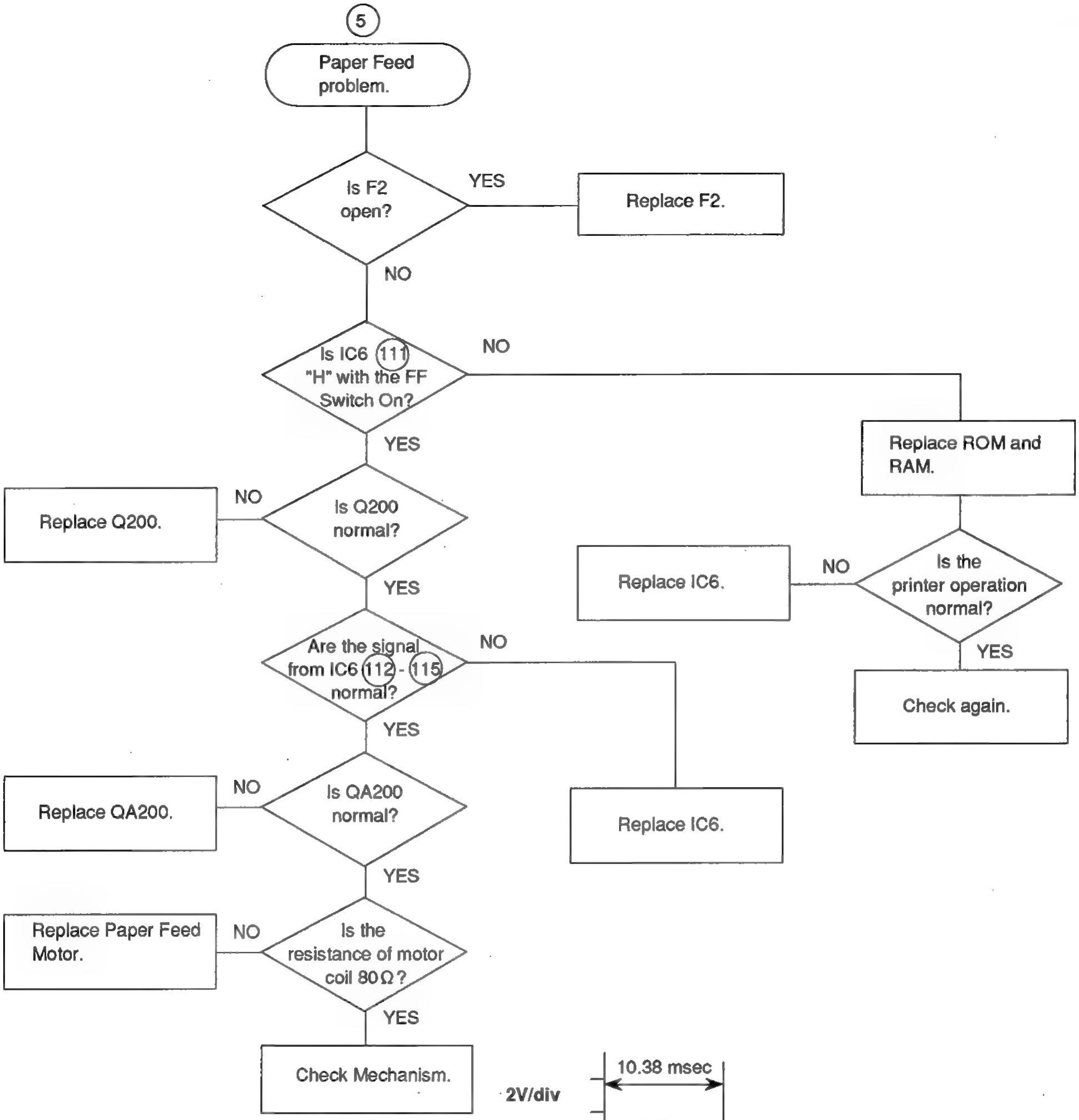

Is the resistance of motor coil(6.8Ω) OK?
NO
Replace Carriage motor.
YES
Check carriage shaft, eccentric cams and its related gears.

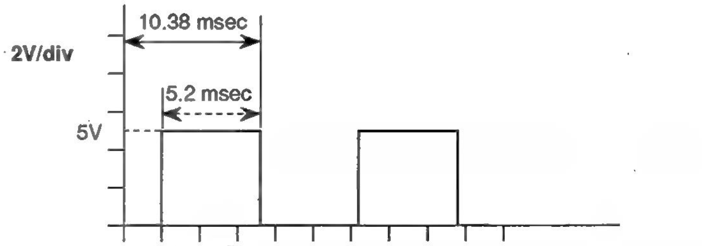


IC6 (107) - (110) Phase Signal Voltage Waveform 0.5msec/div

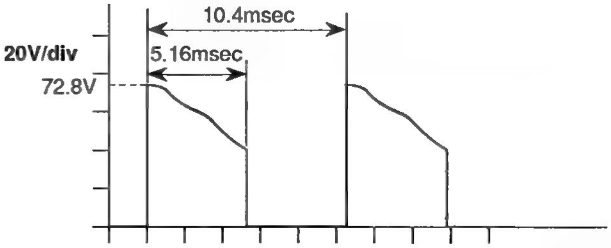


QA201 ①, ⑧, ⑪, (18) Voltage Waveform 0.2msec/div
(DRAFT PRINTING)

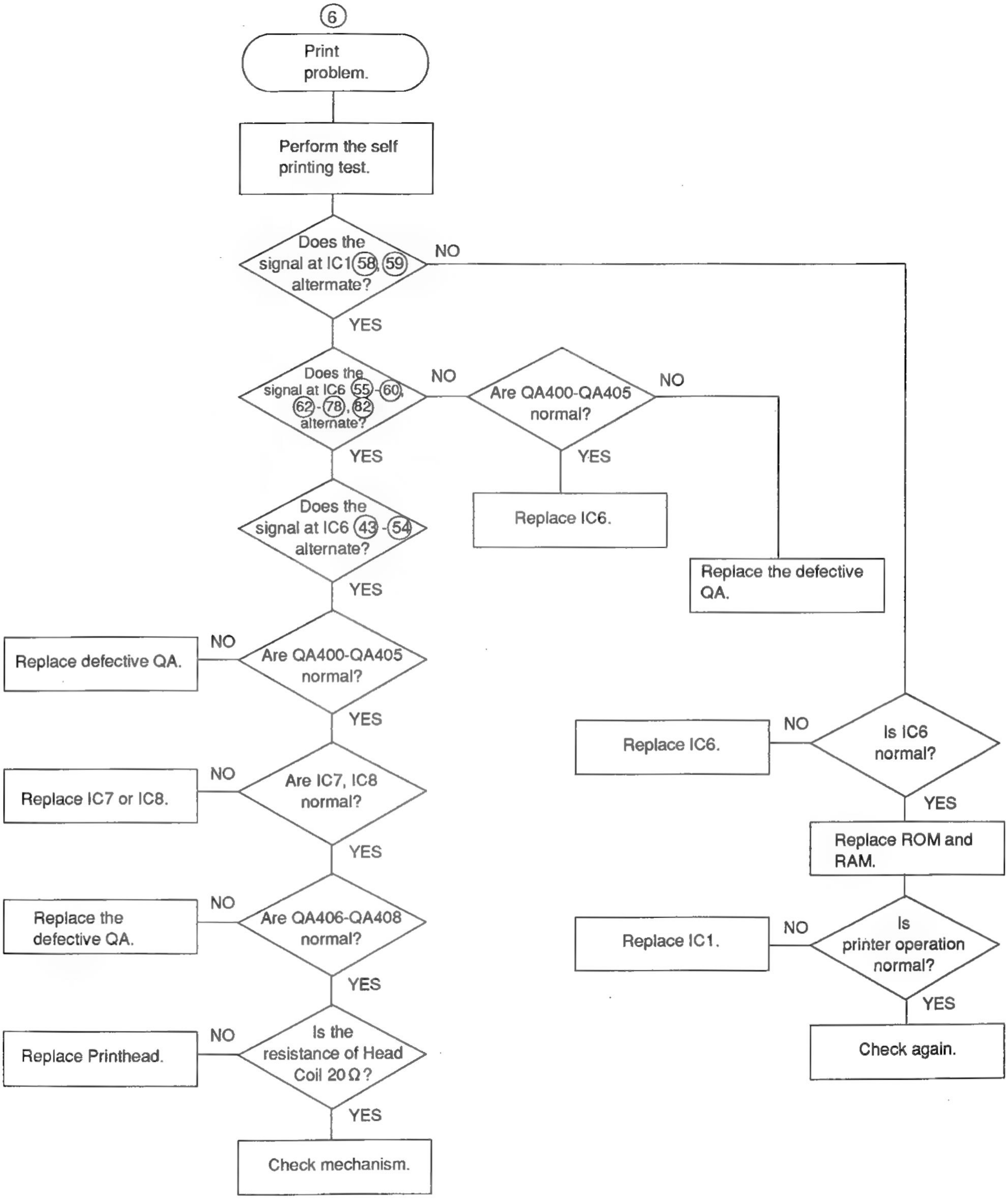

⑤
Paper Feed problem.
Is F2 open?
YES
Replace F2.
NO
Is IC6 (111) "H" with the FF Switch On?
NO
Replace ROM and RAM.
YES
Is Q200 normal?
NO
Replace Q200.
Is the printer operation normal?
NO
Replace IC6.
YES
Check again.
YES
Are the signal from IC6 (112) - (115) normal?
NO
Replace IC6.
YES
Is QA200 normal?
NO
Replace QA200.
YES
Is the resistance of motor coil 80Ω?
NO
Replace Paper Feed Motor.
YES
Check Mechanism.

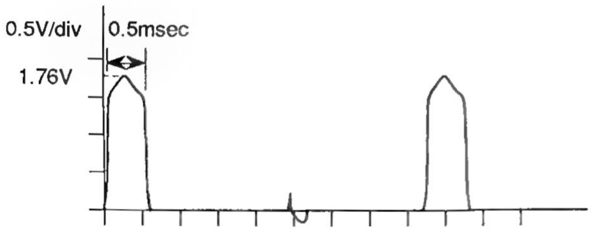


IC6 (112) - (115) Phase Signal Voltage Waveform 2msec/div

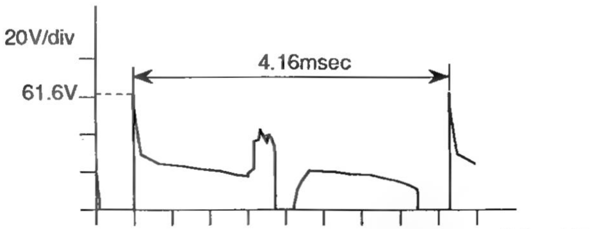


QA200③,⑤,⑦,⑨ Voltage Waveform 2msec/div
(LF OR FF Switch ON)


⑥
Print problem.
Perform the self printing test.
Does the signal at IC1 ㊽, ㊾ altermate?
NO
YES
Does the signal at IC6 55-60, 62-78, 82 alternate?
NO
YES
Are QA400-QA405 normal?
NO
YES
Replace IC6.
Replace the defective QA.
Does the signal at IC6 43-54 alternate?
YES
Replace defective QA.
NO
Are QA400-QA405 normal?
YES
Replace IC7 or IC8.
NO
Are IC7, IC8 normal?
YES
Replace the defective QA.
NO
Are QA406-QA408 normal?
YES
Replace Printhead.
NO
Is the resistance of Head Coil 20Ω?
YES
Check mechanism.
Replace IC6.
NO
Is IC6 normal?
YES
Replace ROM and RAM.
Replace IC1.
NO
Is printer operation normal?
YES
Check again.

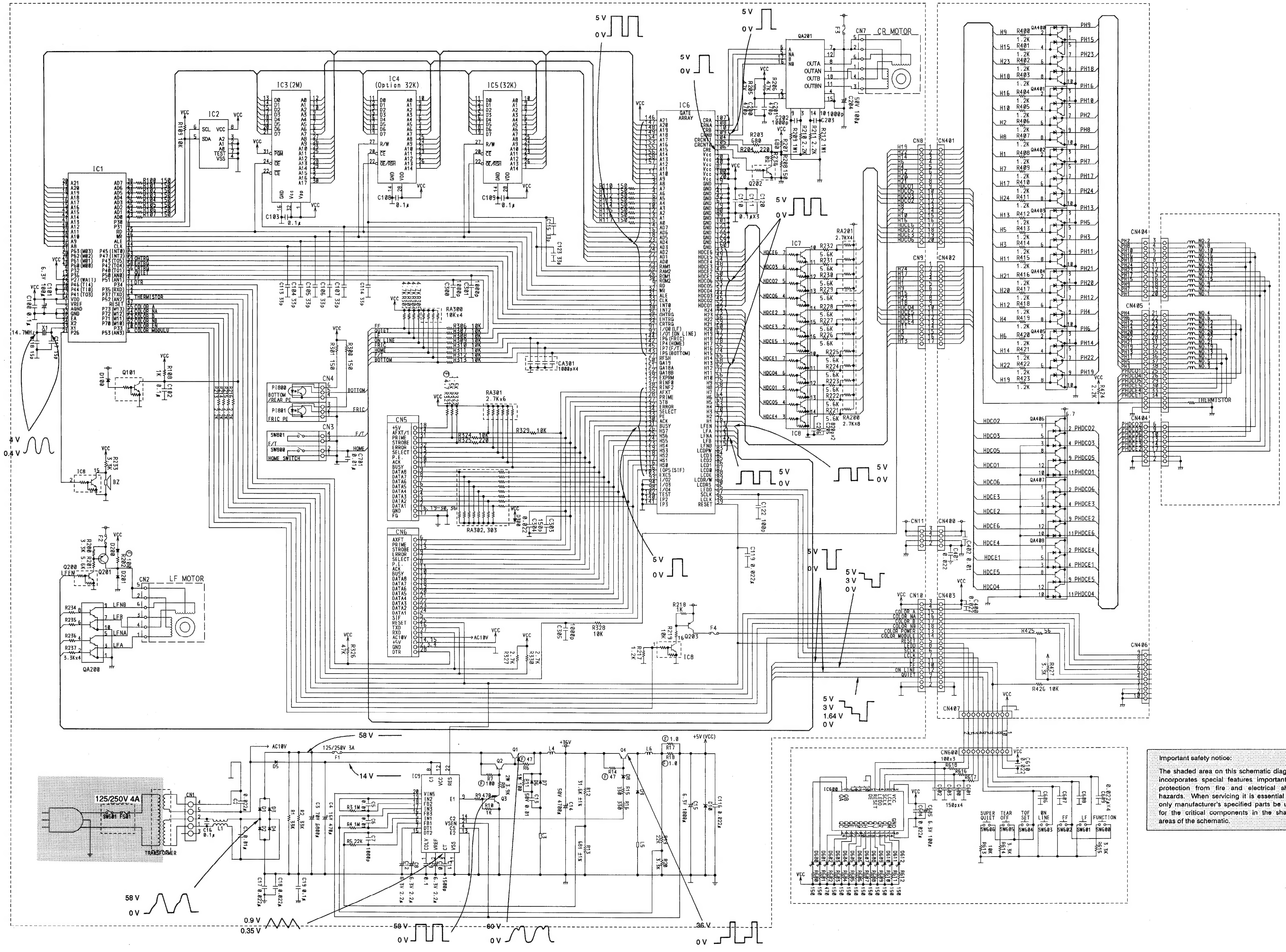


QA400-QA405 Base Voltage Waveform



QA400-405 Collector Voltage Waveform
(Ageing Test Mode)

8.6 Schematic Diagram
[Main Board]

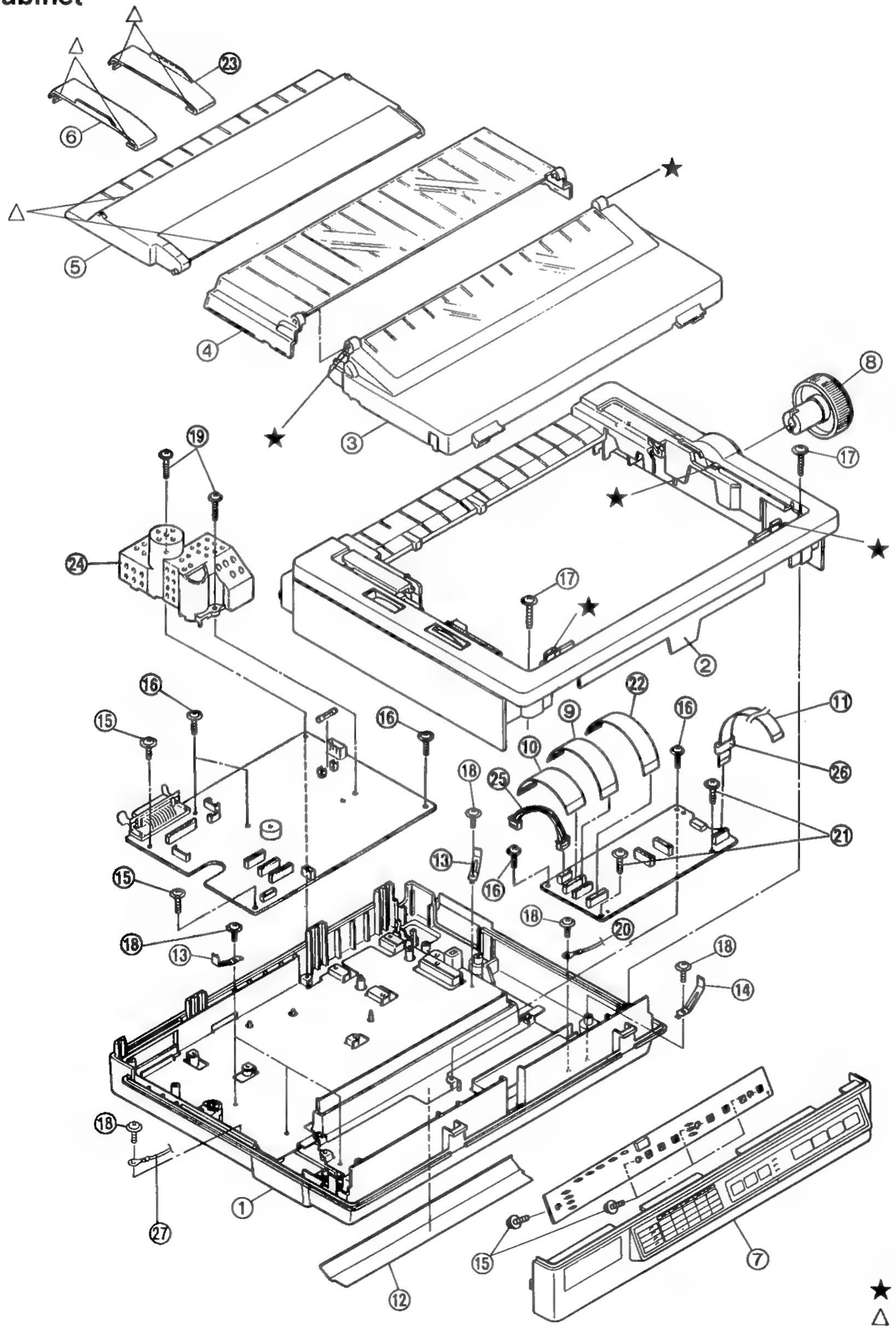

IC1
IC2
IC3 (2M)
IC4 (Option 32K)
IC5 (32K)
IC6 GATE ARRAY
IC7
IC8
IC9
IC600
QA201
CN7 CR MOTOR
CN2 LF MOTOR
CN4
CN3
CN5
CN6
CN8
CN9
CN10
CN11
CN400
CN401
CN402
CN403
CN404
CN405
CN406
CN407
CN600
CN1
TRANSFORMER
125/250V 4A
125/250V 3A
14.7MHz
THERMISTOR
HOME SWITCH
BOTTOM /REAR PE
FRIC PE
SUPER QUIET
TEAR OFF
TOF SET
ON LINE
FF
LF
FUNCTION
5 V
0 V
4 V
0.4 V
3 V
1.64 V
58 V
14 V
0.9 V
0.35 V
60 V
36 V
+36V
+5V (VCC)
AC10V

Important safety notice:
The shaded area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

9. Parts List and Lubrication

Notes: 1. Important safety notice.
Components identified by⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacture's specified parts.
2. The S mark is for service standard parts and may differ from production parts.

9.1 Cabinet



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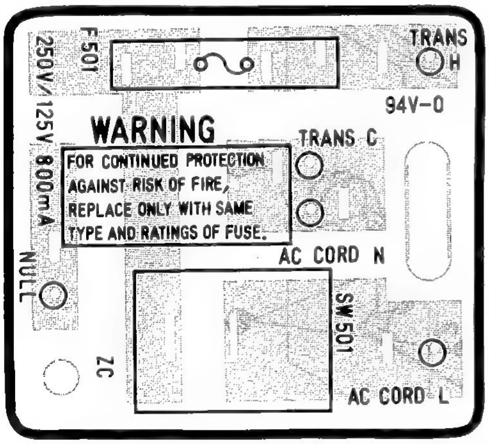
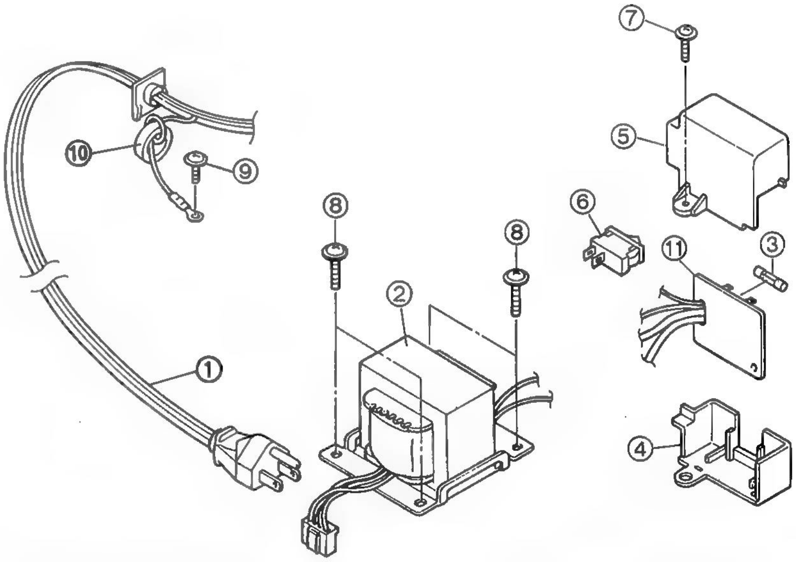
=Lubrication=
★ PJOL-SG3451
△ PJOL-PG671

(Cabinet)

Ref.No.	Part No.	Part Name and Description	Per Set	Remarks
1	PJYMP2123M	Lower Cabinet Assembly	1	
2	PJYFP2180M	Upper Cabinet Assembly	1	
3	PJYK2P2180M	Smoked Plastic Cover Assembly	1	
4	PJYKP2180M	Sound Proof Cover Assembly	1	
5	PJKK113Z	Paper Stand	1	
6	PJUG133Z	Paper Guide (L)	1	
7	PJYK1P2123M	Front Panel Assembly	1	
8	PJYTP2180M	Platen Knob Assembly	1	
9	PJJE288Z	Flat Cable (Head Relay)	1	
10	PJJE289Z	Flat Cable (Head Relay)	1	
11	PJJE291Z	Relay Cable for Control Panel	1	
12	PJHR5125Z	Bottom Back Tension Sheet	1	
13	PJUS187Z	GND Spring	4	
14	PJUS193Z	GNDSpring	1	
15	XTW3+10F	Screw 3x8 mm	6	
16	XTW3+8L	Screw 3x10 mm	5	
17	XTW3+20F	Screw 3x20 mm	2	
18	XTW3+6L	Screw 3x6 mm	7	
19	XTW3+12L	Screw 3x12 mm	2	
20	PJJS493Z	Ground Wire	1	
21	XTW3+10S	Screw 3x10mm	2	
22	PJJE290Z	Relay Cable for Control Panel/Color Kit Motor	1	
23	PJUG134Z	Paper Guide (R)	1	
24	PJMX137Y	PCB Enclosure Cover	1	
25	PJJS825Z	Lead Wire with Connector	1	
26	PJJN27Z	ES Core	1	
27	PJJT113Z	Earth Lead	1	

9.2 Power Supply


F501
TRANS H
250V/125V 800mA
94V-0
WARNING
FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATINGS OF FUSE.
TRANS C
AC CORD N
NULL
SW 501
ZC
AC CORD L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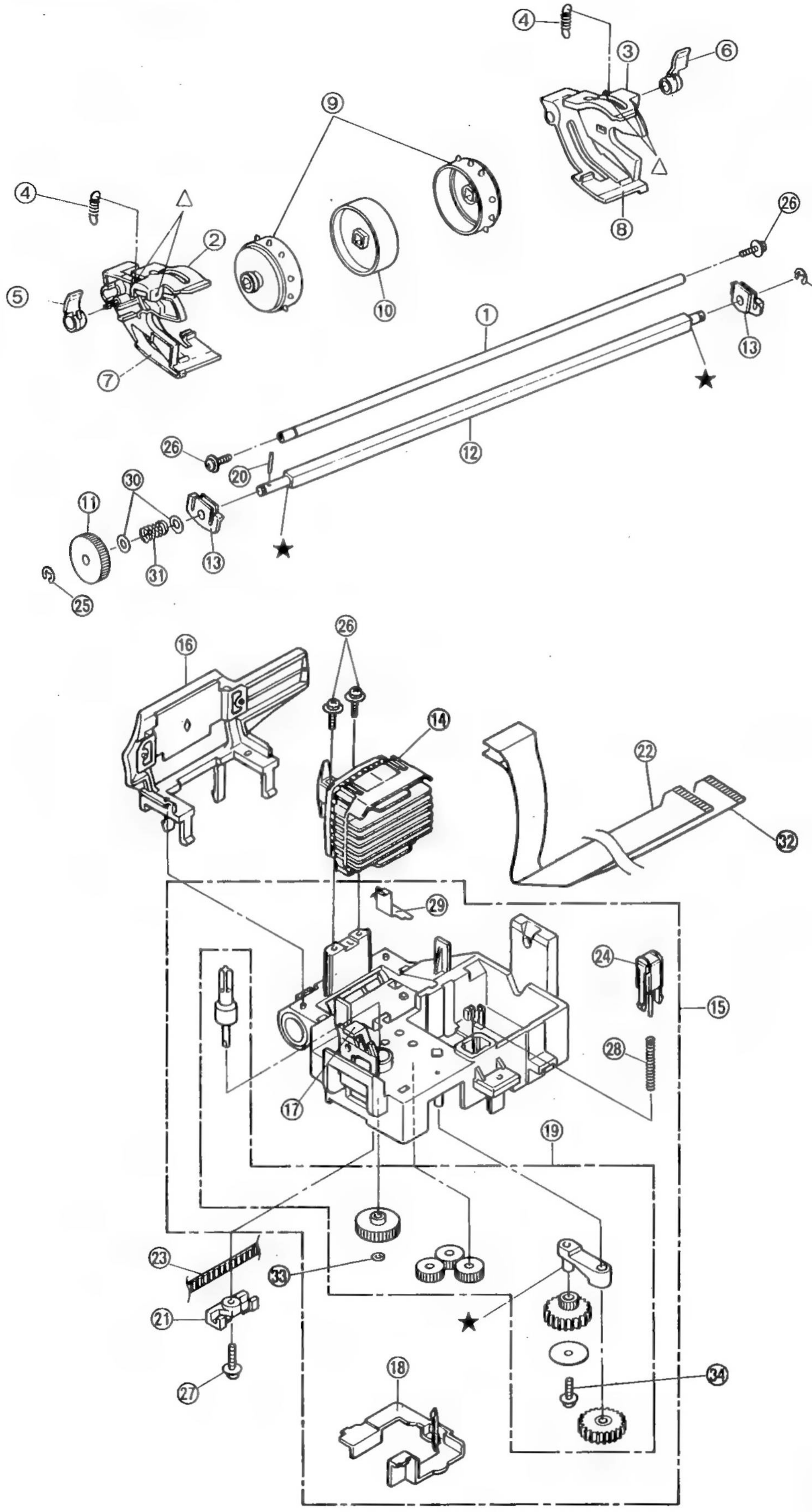
Ref.No.	Part No.	Part Name and Description	Per Set	Remarks
1	PJWAXP1091M	AC Cord Assembly	1	⚠
2	PJWTP2123M	Power Transformer Assembly	1	⚠
3	XBA1C40NU100	Fuse 4A, 250V	1	⚠
4	PJMX133Z	Switch Enclosure Base	1	
5	PJMX132Z	Switch Enclosure Cover	1	
6	EST2011B	Power Switch	1	⚠
7	XTW3+12S	Screw 3x12 mm	1	
8	XTW4+14S	Screw 4x14 mm	4	
9	XTW4+6L	Screw 4x6 mm	1	
10	PJJN18Z	ES Core	1	
11	PJUP535Z	Bare Primary Power Board	1	

9.3 Tractor and Carriage



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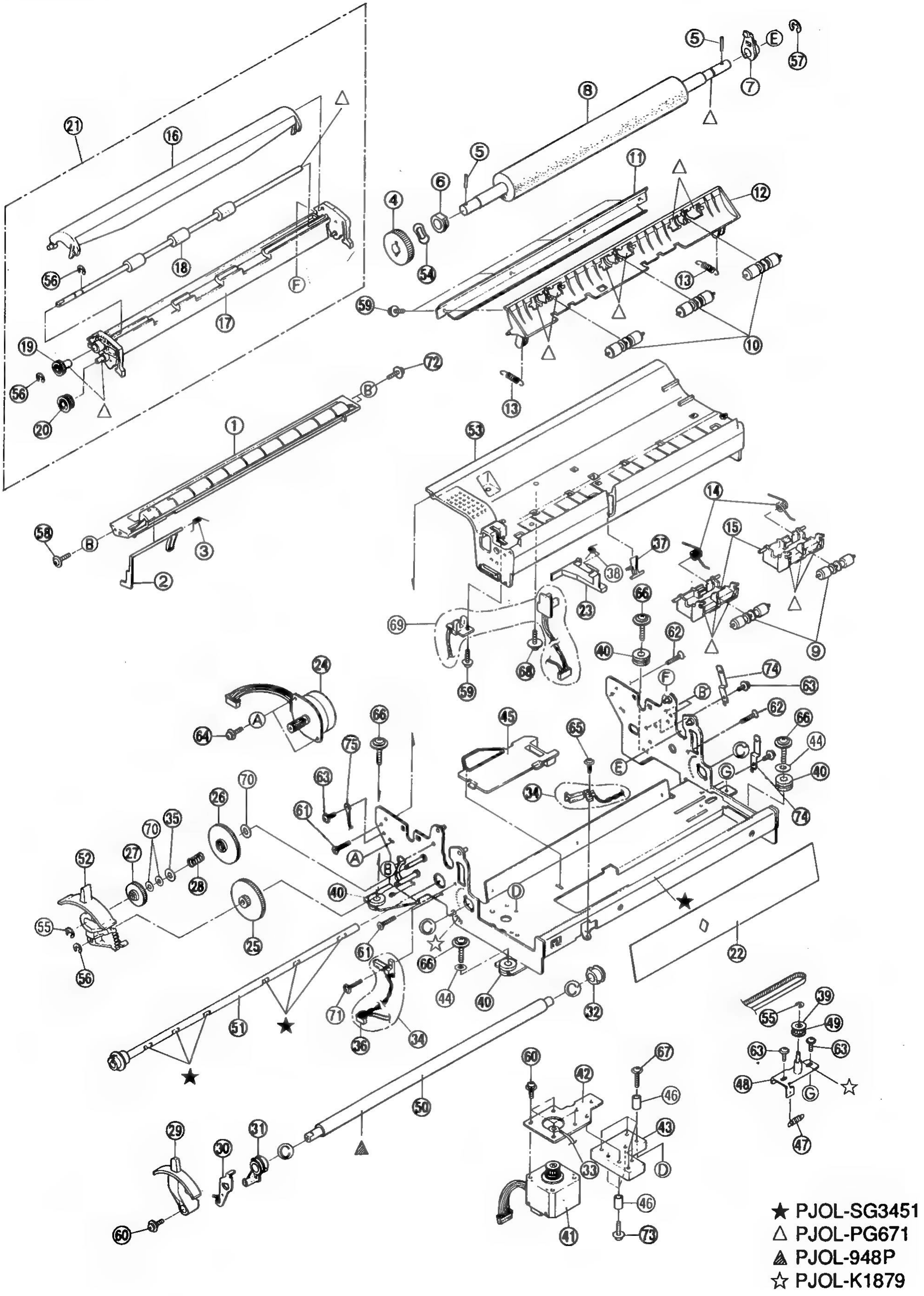
★ PJOL-SG3451
△ PJOL-PG671
▲ PJOL-948P

(Tractor and Carriage)

Ref.No.	Part No.	Part Name and Description	Per Set	Remarks
1	PJDF347Z	Tractor Guide Shaft	1	
2	PJDT87Z	Tractor Cover (L)	1	
3	PJDT88Z	Tractor Cover (R)	1	
4	PJDS3101Z	Spring	2	
5	PJDT89Z	Lock Lever (L)	1	
6	PJDT90Z	Lock Lever (R)	1	
7	PJDT130Z	Tractor Base (L)	1	
8	PJDT131Z	Tractor Base (R)	1	
9	PJDT91Y	Pin Wheel	2	
10	PJDT129Z	Paper Support	1	
11	PJDG50246Z	Tractor Gear	1	
12	PJDF346Z	Tractor Drive Shaft	1	
13	PJDJ06351RZ	Tractor Bushing	2	
14	PJWHP2123M	Head Assembly	1	
15	PJZCP2123M	Carriage Assembly	1	
16	PJZU1P2123M	Ribbon Mask Assembly	1	
17	PJME129Z	Cassette Lever	1	
18	PJUV86Z	Ribbon Feed Gear Cover	1	
19	PJZGP2180M	Gear Kit	1	
20	XPL2A12WFP	Pin	1	
21	PJHR9592Z	Timing Belt Clamp	1	
22	PJUP536Z	Flat Cable	1	
23	PJDV34Z	Timing Belt	1	
24	PJHR9591Z	Ribbon Lifter	1	
25	XUC4FY	E-ring	1	
26	XYN3+F8	Screw 3x8 mm	4	
27	XTB3+12J	Screw 3x12 mm	1	
28	PJDS4240Z	Lift Spring	1	
29	PJUS194Z	Head Earth	1	
30	XWG6E10	Washer	2	
31	PJDS5126Y	Spring	1	
32	PJUP537Z	Flat Cable	1	
33	PJNW261Z	Clip	1	
34	XTW23+6F	Screw	1	

9.4 Chassis



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★ PJOL-SG3451
△ PJOL-PG671
▲ PJOL-948P
☆ PJOL-K1879

(Chassis)

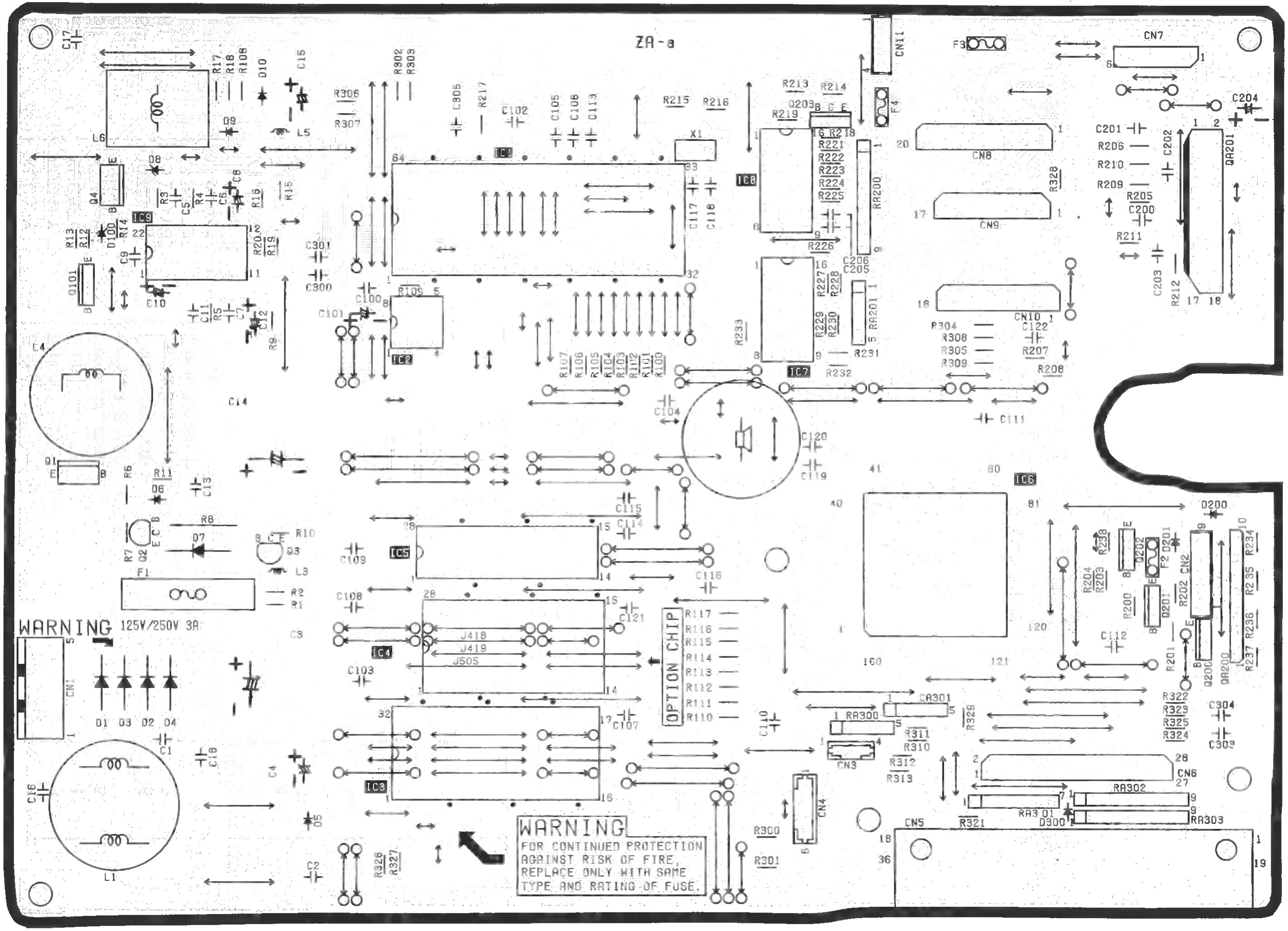
Ref.No.	Part No.	Part Name and Description	Per Set	Remarks
1	PJUG131Z	Paper Separator	1	
2	PJHR9601Z	Paper End Sensor Contact Lever	1	
3	PJDS7093Z	Spring	1	
4	PJDG50247Z	Platen Gear	1	
5	XPL2A14WFP	Pin	2	
6	PJDJ09041CZ	Platen Bushing (L)	1	
7	PJDJ10061RZ	Platen Bushing (R)	1	
8	PJZRP2180M	Platen Assembly	1	
9	PJDR128Z	Friction Roller (Front)	2	
10	PJDR129Z	Friction Roller (Rear)	3	
11	PJUL135Z	Guide Support	1	
12	PJZU2P2180M	Paper Guide Assembly	1	
13	PJDS51213Y	Spring	2	
14	PJDS7091Z	Spring	2	
15	PJUR18Z	Roller Holder	2	
16	PJUG132Z	Ejection Roller Cover	1	
17	PJUA219Z	Ejection Roller Base	1	
18	PJDR130Z	Ejection Roller	1	
19	PJDG50255Z	Ejection Roller Gear	1	
20	PJDG50256Z	Ejection Roller Idle Gear	1	
21	PJZR1P2180M	Ejection Roller Assembly	1	
22	PJHR5124Z	Back Tension Sheet	1	
23	PJHR9599Z	Paper End Sensor Contact Lever	1	
24	PJJQ156Y	Line Feed Motor	1	
25	PJDG50258Z	Middle Gear	1	
26	PJDG50249Z	Clutch Gear (A)	1	
27	PJDG50250Z	Clutch Gear (B)	1	
28	PJDS51215Z	Clutch Gear Spring	1	
29	PJUB99Z	Head Gap Lever	1	
30	PJUL134Z	Head Gap Plate	1	
31	PJDG5238Z	Eccentric Cam (L)	1	
32	PJDG5239Z	Eccentric Cam (R)	1	
33	PJJT262Z	Earth Lead	1	
34	PJWSP2123M	Home, Friction/Tractor Switch Assembly	1	
35	PJNW412Z	Polyslider	1	
36	PJJS828Z	Connector with Cable	1	
37	PJHR9600Z	Paper End Contact Lever	1	
38	PJDS7025Z	Spring	1	
39	PJDG0906Z	Pulley Flange	1	
40	PJHG328Y	Mount Rubber	4	
41	PJJQ159Z	Carriage Motor	1	
42	PJMM30Z	Carriage Motor Bracket	1	
43	PJHG975Z	Motor Rubber	1	
44	PJNW3110Z	Polyslider	2	
45	PJUV83Z	Head Cable Cover	1	
46	PJHE10Z	Sleeve	8	
47	PJDS5079Z	Bracket Spring	1	
48	PJZHP2180M	Idle Pulley Bracket Assembly	1	
49	PJDG9033Z	Idle Pulley	1	
50	PJDF562Z	Carriage Shaft	1	
51	PJDF9281Z	Friction Cam Shaft	1	
52	PJUB98Z	Paper Feed Selector	1	
53	PJUG129Z	Paper Guide	1	
54	PJHE6046Z	Wave Washer	1	

Ref.No.	Part No.	Part Name and Description	Per Set	Remarks
55	XUC3FY	E-ring	2	
56	XUC4FY	E-ring	3	
57	XUC8FY	E-ring	1	
58	XTW3+8S	Screw 3x8 mm	5	
59	XTW3+8F	Screw 3x8 mm	1	
60	XYN3+F8	Screw 3x8 mm	5	
61	XTS3+12C	Screw 3x12 mm	2	
62	XTS3+12F	Screw 3x12 mm	2	
63	XTW3+6L	Screw 3x6 mm	5	
64	XYN26+C6	Screw 2.6x6 mm	2	
65	XTW26+7L	Screw 2.6x7 mm	1	
66	PJYC3+MC16	Screw 3x16 mm	4	
67	XTW3+10L	Screw 3x10 mm	5	
68	PJHE5065Z	Screw	1	
69	PJWP1P2123M	Sensor Assembly	1	
70	PJNW410Z	Polyslider	3	
71	XTN26+6F	Screw 2.6x6 mm	1	
72	XTS3+10F	Screw 3x10 mm	2	
73	XTW3+12L	Screw 3x12 mm	3	
74	PJUS195Z	Earth Spring	2	
75	PJJT241Z	Earth Lead	1	

9.5 Main Board

(PJWPP2123M)

(Parts Side View)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X1
L1
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L6
C14
J418
J419
J505
OPTION CHIP
WARNING 125V/250V 3A
WARNING
FOR CONTINUED PROTECTION
AGAINST RISK OF FIRE,
REPLACE ONLY WITH SAME
TYPE AND RATING OF FUSE.

?ef.No.	Part No.	Part Name and Description	Per Set	Remarks
		Integrated Circuits, Transistor and Diodes		
	PJVIT90C845N	IC	1	
	PJVI24C01A	IC (EEP ROM)	1	
	PJWIP2123M	IC ROM	1	
	PJVITC51832S	IC RAM	1	
	PJVIGP2402A	IC	1	
,8	PJVIMC1413P	IC	2	
	AN8081NK	IC	1	
4	PJVDRL253F	Diode	4	
6	PJVD1N4003N	Diode	2	
	PJVDERC91	Diode	1	
	PJVD04AZ11X	Diode	1	
	PJVDD1NLTA	Diode	1	
)	PJVD05AZ6.2Z	Diode	1	
)0	PJVD04AZ39U	Diode	1	
)0	1SS178	Diode	1	
)1	PJVD1N4003N	Diode	1	
)0	1SS178	Diode	1	
	2SC3568	Transistor	1	
	2SA1450S	Transistor	1	
	2SC3359S	Transistor	1	
	2SB1393P	Transistor	1	
)1	PJVIDTC114ES	Transistor	1	
)0,202	PJVIDTC114ES	Transistor	2	
)1,203	2SB1333N	Transistor	2	
		Resistors		
2	ERDS2FJ333	33K 1/4W Carbon	2	S
4	ERDS2FJ105	1M 1/4W Carbon	2	S
	ERDS2FJ223	22K 1/4W Carbon	1	S
	ERQS2BJ470	47 1/4W Carbon	1	S
	ERQS2BJ101	100 1/4W Carbon	1	S
	ERG2SJ392	3.9K 2W Metal	1	
	ERDS2FJ471	470 1/4W Carbon	1	S
)	ERDS2FJ102	1K 1/4W Carbon	1	S
	ERG1SJ101	100 1W Metal	1	
!	EROS2TKF3162	31.6K 1/4W Metal	1	
!	EROS2TKF6810	681K 1/4W Metal	1	
!	ERQS2BJ470	47 1/4W Metal	1	
;,16	ERDS2FJ331	330 1/4W Carbon	2	S
',18	ERQS2BJ1RO	1 1/4W Metal	2	
)	ERDS2FJ223	22K 1/4W Carbon	1	S
)	ERDS2FJ332	3.3K 1/4W Carbon	1	S
)0-107	ERDS2FJ151	150 1/4W Carbon	8	S
)8	ERDS2FJ102	1K 1/4W Carbon	1	S
)9	ERDS2FJ103	10K 1/4W Carbon	1	S
0-117	ERDS2FJ151	150 1/4W Carbon	8	S
)0	ERDS2FJ332	3.3K 1/4W Carbon	1	S
)1	ERDS2FJ562	5.6K 1/4W Carbon	1	S
)2	ERQS2BJ101	100 1/4W Carbon	1	S
)4	ERDS2FJ221	220 1/4W Carbon	1	S
)5,206	ERDS2FJ473	47K 1/4W Carbon	2	S
)7,203	ERDS2FJ681	680 1/4W Carbon	2	S
)8	ERDS2FJ151	150 1/4W Carbon	1	S

Ref.No.	Part No.	Part Name and Description			Per Set	Remarks
R209,212	ERX1SJ1RO	1	1W	Metal	2	
R210,211	ERDS2FJ222	2.2K	1/4W	Carbon	2	S
R213-216	ERDS2FJ222	2.2K	1/4W	Carbon	4	S
R217	ERDS2FJ122	1.2K	1/4W	Carbon	1	S
R218	ERDS2FJ102	1K	1/4W	Carbon	1	S
R219	ERDS2FJ103	10K	1/4W	Carbon	1	S
R221-232	ERDS2FJ562	5.6K	1/4W	Carbon	12	S
R233-237	ERDS2FJ332	3.3K	1/4W	Carbon	5	S
R238	ERDS2FJ0	0	1/4W	Carbon	1	S
R300,301	ERDS2FJ151	150	1/4W	Carbon	2	S
R302-305	ERDS2FJ472	4.7K	1/4W	Carbon	4	S
R306-313	ERDS2FJ103	10K	1/4W	Carbon	8	S
R321	ERQS2BJ4R7	4.7	1/4W	Metal	1	
R322,323	ERDS2FJ152	10K	1/4W	Carbon	2	S
R324	ERDS2FJ103	10K	1/4W	Carbon	1	S
R325	ERDS2FJ221	220	1/4W	Carbon	1	S
R330,327	ERDS2FJ272	2.7K	1/4W	Carbon	2	S
R326	ERDS2FJ473	4.7K	1/4W	Carbon	1	S
R328,329	ERDS2FJ103	10K	1/4W	Carbon	2	S
		Capacitors				
C1	ECKR2H103ZU	0.01	25V	Electrolytic	1	
C2,17,18	ECKD1H223ZF	0.022	50V	Ceramic	3	S
C3	ECOS70P682	6800P	70V	Electrolytic	1	
C4	ECEA1CU471	470P	16V	Electrolytic	1	
C5,6,13	ECKD1H103ZF	0.01	50V	Ceramic	3	S
C7	ECKD1H102KB	1000P	50V	Ceramic	1	S
C8,10,12	ECEA1HK2R2	2.2	50V	Electrolytic	3	
C9,19	ECFD1E104ZF	0.1	25V	Electrolytic	2	
C11	ECQM1H152JV	1500P	50V	Semi-Conductor	1	S
C14	ECET50S472	4700P	50V	Electrolytic	1	
C15	ECEA0JU102	1000P	6.3V	Electrolytic	1	
C16	ECQV1104JZ3	0.1	100V	Film	1	
C100,102	ECFD1E104ZF	0.1	25V	Electrolytic	2	
C101	ECEA0JU101	100P	6.3V	Electrolytic	1	
C103	ECFD1E104ZF	0.1	25V	Electrolytic	1	
C104,107	ECBT1H330J5	33P	50V	Electrolytic	2	
C105,106	ECCT1H330JC	33P	50V	Ceramic	2	S
C108-111,120	ECFD1E104ZF	0.1	25V	Electrolytic	5	
C113	ECCT1H330JC	33P	50V	Ceramic	1	S
C114,115	ECBT1H330J5	33P	50V	Electrolytic	2	
C116	ECBT1E223ZF	0.022	35V	Electrolytic	1	
C117,118	ECCT1H150JC	15P	50V	Ceramic	2	S
C119	ECKD1H223ZF	0.022	50V	Ceramic	1	S
C122	ECKD1H101KB	100P	50V	Ceramic	1	S
C123	ECBT1H330J5	33P	50V	Electrolytic	1	
C200,201	ECKD1H471KB	470P	50V	Ceramic	2	S
C202,203	ECBT1H102KB	1000P	50V	Electrolytic	2	
C204	ECEA1HU101	100P	50V	Electrolytic	1	
C300,301	ECKD1H102KB	1000P	50V	Ceramic	2	S
C304	ECKD1H223ZF	0.022	50V	Ceramic	1	S
C303	ECKD1H151KB	150P	50V	Ceramic	1	S
C305	ECKD1H102KB	1200P	50V	Ceramic	1	S
C205,206	ECBT1H821KB	820P	50V	Electrolytic	2	

All capacitor values are in microfarads unless otherwise noted.

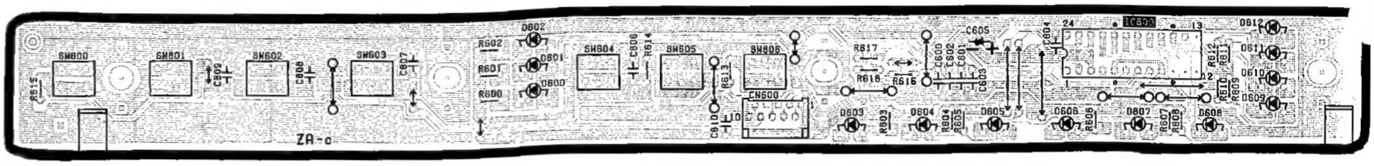
Ref.No.	Part No.	Part Name and Description	Per Set	Remarks
		Component Combinations		
301	EXFP4102ZFW	C-Array	1	
200	EXBF9E272J	R-Array	1	
201	EXBF5E272J	R-Array	1	
300	EXBF5E103J	R-Array	1	
301	EXBF7E272J	R-Array	1	
302,303	EXBF9L286J	R-Array	2	
200	PU4145	Transistor Array	1	
201	PJVISLA7024M	Transistor Array	1	
		Other Parts		
1	PJSCPKM22EPP	Buzzer	1	
1	PJJP336Z	Connector	1	
2	PJJP160Z	Connector, Line Feed Motor	1	
3	PJJP269Z	Connector, Home and Friction/Tractor Switch	1	
4	PJJP169Z	Connector, Paper End Sensor	1	
5	PJJS29W	Connector, Centronics	1	
6	PJJS460Z	Connector, Option	1	
7	PJJP301Z	Connector, Carriage Motor	1	
8	PJJS397Z	Connector	1	
9	PJJS424Z	Connector	1	
10	PJJS425Z	Connector	1	
11	PJJP184Z	Connector	1	
	XBA2C30ND1L	Fuse	1	
-4	XBAICPF50	IC Protector	3	
	PJLQS102	Coil	1	
,5	EXCELSR35T	Coil	2	
	PJLQ12Y	Coil	1	
	PJLQ11X	Coil	1	
	PJVCSA14.7MX	X'Tal	1	
1	PJMY66Z	Heat Sink	1	
1	PJWPP2123M	Main Board Complete	1	Note 3
	PJWPP2123M1	Main Board Complete	1	Note 4

e 3: This Main Board Complete (PJWPP2123M) must only be used with the Relay Terminal Board part number (PJWP3P2123M).

e 4: This Main Board Complete (PJWPP2123M1) must only be used in machines with the Relay Terminal Board marked with part number PJWP3P2123M1.

* **A service manual supplement will be issued containing schematics and component part number information for Main Logic Board (PJWPP2123M1) and Relay Terminal Board (PJWP3P2123M1).**

9.6 Control Panel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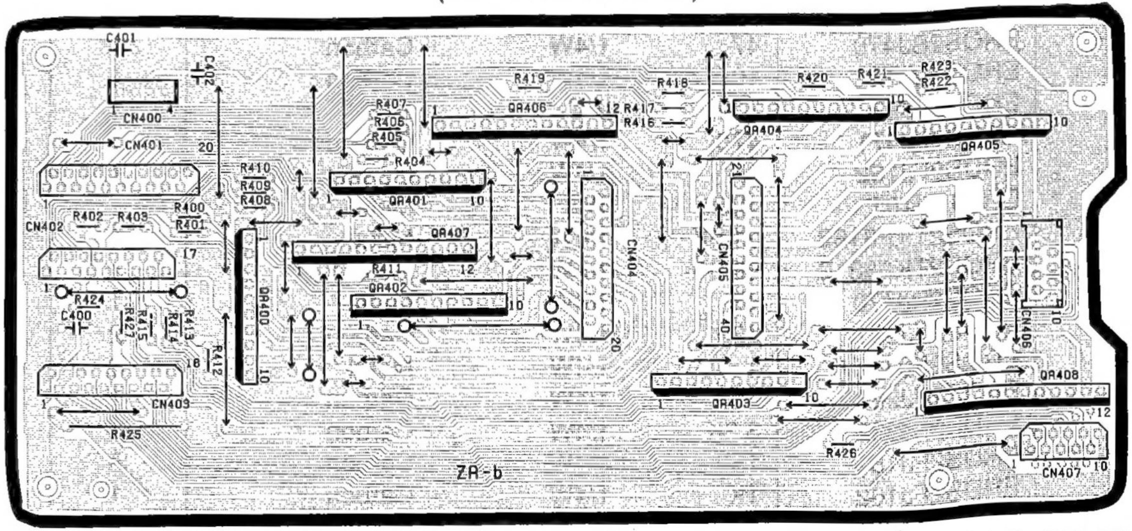
R612
IC600
ZA-c

(Parts Side View)

Ref.No.	Part No.	Part Name and Description			Per Set	Remarks
IC600	PJVIM66311P	IC			1	
D600,601	LN342GPX	Diode			2	
D602	LN242RPX	Diode			1	
D603-612	LN342GPX	Diode			10	
R600,601	ERDS2FJ151	150	1/4W	Carbon	2	S
R602	ERDS2FJ471	470	1/4W	Carbon	1	S
R603-612	ERDS2FJ151	150	1/4W	Carbon	10	S
R613	ERDS2FJ103	10K	1/4W	Carbon	1	S
R614,615	ERDS2FJ332	3.3K	1/4W	Carbon	2	S
R616-618	ERDS2FJ101	100	1/4W	Carbon	3	S
C600-603	ECBT1H151KB	150P	50V	Ceramic	4	S
C604	ECBT1E223ZF	0.022	35V	Ceramic	1	S
C605	ECEA0JK101	100P	6.3V	Electrolytic	1	
C606-610	ECBT1E223ZF	0.022	35V	Ceramic	5	S
CN600	PJJS656Z	Connector			1	
CN601	PJJP236Z	Connector			1	
SW600-606	EVQ-QS205K	Switch			7	
PB2	PJWP2P2123M	Control Panel Board Complete			1	

9.7 Sensor and Relay Terminal Board

(PJWP3P2123M)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QR401
QR407
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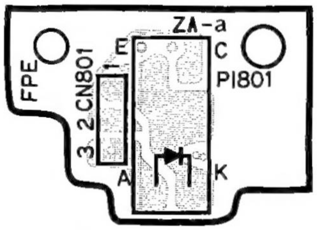
R426
CN407
ZA-b

(Relay Terminal Board) (Parts Side View)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PI801
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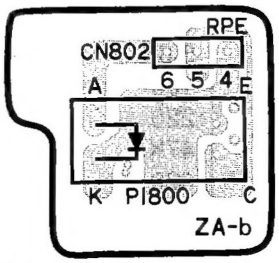
(Home and Friction/Tractor Sensor Board)


RPE
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PI800
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ZA-b

(Paper End Sensor Board)

Ref.No.	Part No.	Part Name and Description	Per Set	Remarks
R400-423	ERDS2FJ122	1.2K 1/4W Carbon	24	
R424	ERDS2FJ222	2.2K 1/4W Carbon	1	
R425	ERG3SJ560	56 3W Metal	1	
R426	ERDS2FJ103	10K 1/4W Carbon	1	
R427	ERDS2FJ332	3.3K 1/4W Carbon	1	
R428,429	ERDS2FJ562	5.6K 1/4W Carbon	12	
R440-448	ERD2FJ272	2.7K 1/4W Carbon	9	
RA401	EXBF4E272J	R-Array	1	
C400,401	ECKD1H223ZF	0.022 50V Ceramic	2	
C402	ECKD1H103ZF	0.01 50V Ceramic	1	
QA400-405	PJVIMP4102	Transistor Array	6	
QA406-408	PJVIMP4305	Transistor Array	3	
CN400	PJJP184Z	Connector	1	
CN401	PJJS397Z	Connector	1	
CN402	PJJS424Z	Connector	1	
CN403	PJJS425Z	Connector	1	
CN404,405	PJJS397Z	Connector	2	
CN406	PJJS656Z	Connector	1	
CN407	PJJS417Z	Connector	1	
PB3	PJWP3P2123M	Relay Terminal Board Complete	1	Note 5
	PJWP3P2123M1	Relay Terminal Board Complete	1	Note 6
PI800,801	PJVSSG206	Photo Interrupter	2	
1	PJUP533Z-a	Friction Paper End Sensor Bare PCB	1	
2	PJUP533Z-b	Rear/Bottom Paper End Sensor Bare PCB	1	
Packing Materials				
P1	PJQX6400Z	Instruction Book	1	
P2	PJQX1864Z	Quick Reference Card	1	
P3	PJPG1003Z	Carton Box	1	
P4	PJPN664Z	Pad (L)	1	
P5	PJPN665Z	Pad (R)	1	

Note 5: This Relay Terminal Board (PJWP3P2123M) must only be used in machines with the Main Board Complete marked with part number PJWPP2123M.

Note 6: This Relay Terminal Board (PJWP3P2123M1) must only be used in machines with the Main Board Complete marked with part number PJWPP2123M1.

*** A service manual supplement will be issued containing schematics and component part number information for Main Logic Board (PJWPP2123M1) and Relay Terminal Board (PJWP3P2123M1).**

Panasonic KX-P2123
4-Color / Black 24-pin DOT Matrix Printer

Panasonic Communications & Systems Company
Computer Products Division Division of Matsushita Electric Corporation of America
2 Panasonic Way
Secaucus, New Jersey 07094

Panasonic Sales Company Division of Matsushita Electric of Puerto Rico, Inc.
San Gabriel Industrial Park, 65th Infantry Avenue KM. 9.5
Carolina, Puerto Rico 00630

Matsushita Electric of Canada Limited
5770 Ambler Drive
Mississauga, Ontario, L4W 2T3

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530·91, Japan

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